

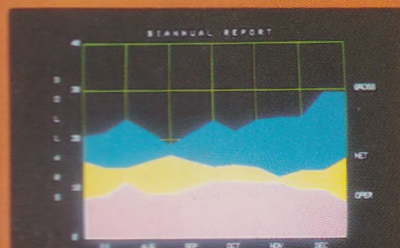
micro[®] COMPUTING

The Practical Journal of Advanced Computing

**Tandy:
Number 3
And Trying
Hardest**

**Integrated
Software**

Symphony? Framework? Or Both?



Also, reviews of—

- Open Access
- Electric Desk
- InteSoft Series

**Conclusion of
WP Roundup**



File: MEMO.DOC Memory: 142000 Free INSERT on Line 6, Col. 1

Date: 23 October 1984

To: John Kelly, Marketing
From: Jim Kelly, Division Sales

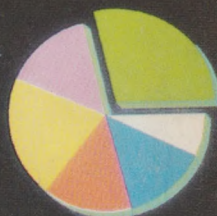
Subject: 2nd quarter figures

John,

Thanks for getting the second quarter figures to me so quickly. I feel that I have a better grasp of what your division is up against now. As we discussed on the phone, the key to meeting performance in the 3rd quarter is to aggressively pursue the accounts that have slipped up in the past.

EXPENDITURES FOR APRIL

• SALES 20%
• PURCHASING 14%
• R & D 21%
• ACCOUNTING 15%
• MARKETING 12%
• CONSTRUCTION 8%



This is record 1326 of 2570

File: CLIENTS.DAT

Name: Duncan Kelly
Address: 580 Hillcrest Drive
City: Peterborough
State: NH
Zip code: 03459
Telephone: 603-555-3402
Last contact: 8 September 1983
Division: Northeastern

(F1) Previous record (F2) Next record
(F3) Change this record (F4) Delete this record
(F5) Search for next (F6) Return to main menu

Update on 11/01/84 Elapsed time: 14:24.00
Previous: 000 Div: Datafile 04 76/0000.DAT

1. Latest AP Stocks/Bonds Quotations
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2. Stocks/Bonds Symbol Lookup Table

Instructions
Enter item number or 0=help: 1

Enter Stock/Bond Symbols or Press Return for Previous Menu

Date	Time	Symbol	P-E	(Yds)	High	Low	Last	Chg
10/21	15:12	IBM	13	17739	125 3/4	123 1/2	125 1/8	+ 2 7/8

Enter Stock/Bond Symbols or Press Return for Previous Menu

(F1) Toggle view (F2) Toggle printer (F3) Next Screen (F4) Backscreen

A BUREAUCRAT'S GUIDE TO WORD PROCESSING

Now, if it were you or I and we wanted a word processing program for our IBM-type PC, we'd probably stop off at our local computer store and simply diddle with a few.

You and I, however, are not the U.S. Department of Agriculture.

(Nor any of its permutations of subsystems like the Economic Research Service, National Resources Economics Division, Data Services Center, etc., etc.)

So when the USDA told ERS to tell NRED and DSC to look into a truckload of w.p. programs for all their PCs, the last thing they wanted was simple diddling. Their dedicated Wangs and Lexitrons were far too few to handle their

needs, their IBM® PCs weren't compatible with them anyway, and nobody really, quantifiably, knew from word processing with a personal computer.

Definitely not a diddling-mode condition.

As they put it in The Exchange, an internally distributed publication of the Department of Agriculture: "A needs assessment showed that, in the long-term, a word processing system is needed that can increase word processing capability and also be compatible with ERS' Long Range Information Management goals."

Well. "Needs assessment" led swiftly to "procurement action," which galloped into an "objective review" of the eight top-rated PC programs on the market (as compiled by The Ratings Book published by Software Digest), along with Wordstar® and Display Write 2, because they had some around.

Thus armed with the names, the final evaluators (a team of secretaries from NRED who would be the primary users of the PC software) became armed with each of the programs, along with checklists to record such things as ease of use, advanced features, and similarity to their existing dedicated equipment.

The first to be eliminated from the prospect list were Office Writer™

and Samna™, since they're copy-protected and couldn't be transferred to hard disks.

Next, IBM's Display Write 2: because it's "not compatible with other software used in ERS (like Lotus 1-2-3,™ dBASE II,® etc.)," and it's "full of confusing menu options and cryptic error messages." Au revoir IBM.

Then, three more, for a variety of reasons.

Which left the following:

Volkswriter® Deluxe™

MultiMate™

Leading Edge™

Volkswriter Deluxe? "Too complicated and confusing." Not "easy to learn or use."

MultiMate? Not bad. It actually tied the winner in a few categories.

The winner being the one that won 82% of the votes in the Ease of Use/Ease of Learning categories. The one about which they said, "The ability to store deleted text and automatic document backup features were both highly desirable." The one they thought they'd quickly "be able to use ... for their day-to-day word processing tasks."

The whole process took some three months of work by people in DSC to support the NRED in its work with the ERS and DSC to make the world a better place for the USDA.

But the results were well worth the wait. Because at last they've solved their word-processing problems ...

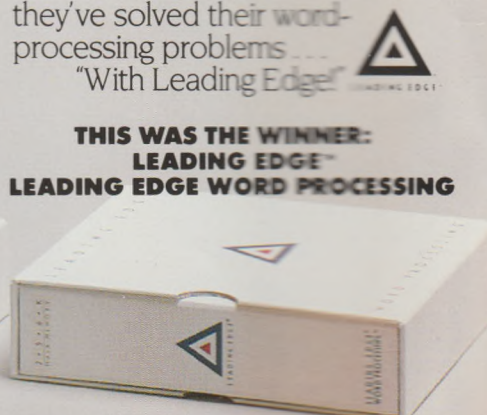
"With Leading Edge!"

**THIS WAS THE WINNER:
LEADING EDGE™
LEADING EDGE WORD PROCESSING**

THESE ARE THE PACKAGES THE COMMITTEE EVALUATED:



THESE WERE THE FINALISTS:



LEADING EDGE PRODUCTS, INC.
LEADING EDGE SOFTWARE DIVISION, 21 HIGHLAND CIRCLE, NEEDHAM, MA 02194, TEL. 800-343-3436, (617) 449-4655
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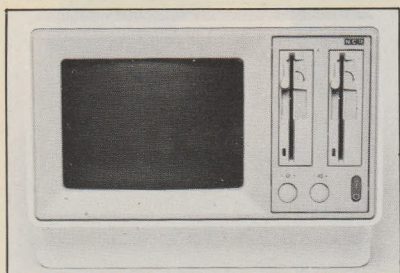
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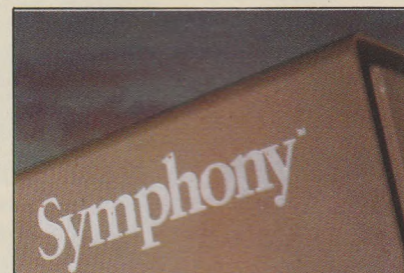
An H&R Block Company



50 NCR's Clone



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My Automated Home
By Frank J. Derfler, Jr.

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Unix Editors Have Jobs
By Phil Hughes

Special Report: Integrated Software

60 Symphony and Framework: Friends Or Foes?

Will Symphony and Framework battle it out for predominance in the world of integrated software, or are they diverse enough to coexist in harmony? Shawn Bryan ran both through their paces and he reports on where these highly touted packages shine and where they fail.
By Shawn Bryan.

78 Open Access: An Integrated Bundle of Joy

What have Symphony and Framework got that Open Access ain't got? Not much. This powerful integrated package is a complete interactive data-sharing system. By Charles Perelman.

100 Electric Desk—No Razzle, a Little Dazzle

If your software needs don't call for a souped-up, high-priced integrated package, Electric Desk may be the software you've been waiting for. It offers only the basic applications; it also offers a reasonable price tag.
By Eric Grevstad.

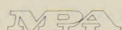
106 The InteSoft Series: Innovative Integration

The InteSoft series, from Schuchardt Software Systems, takes a new approach to integrated software. The series comprises ten programs (we review five) that can function independently, but can also be integrated as you see fit. By J. Terry Edwards and Deborah L. Edwards

ARTICLES

46 Soup Up WordStar On Your Sanyo

One of the major advantages of the Sanyo MBC-550 computer is the slew of software bundled with it. The most notable of the bundle is MicroPro's WordStar. Version 3.30 is well-integrated on the Sanyo, but it is slow. This article, for Sanyo users, tells you how to liven up WordStar.
By Richard Kruse.



Microcomputing is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 52 computer publications in 19 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina*; Australia's *Australia Computerworld*, *Australian Micro Computer Magazine*, *Australian PC World and Directories*; Brazil's *DataNews* and *MicroMundo*; China's *China Computerworld*; Denmark's *Computerworld/Danmark* and *MicroVerden*; Finland's *Mikro*; France's *Le Monde Informatique*, *Golden (Apple)* and *OPC (IBM)*; Germany's *Computerwoche*, *Microcomputerwelt*, *PC Welt*, *Software Markt*, *CW Edition/Seminar*, *Computer Business* and *Commodore Magazine*; Italy's *Computerworld Italia*; Japan's *Computerworld Japan* and *Perso ComWorld*; Mexico's *Computerworld/Mexico* and *CompuMundo*; Netherlands' *CW Benelux* and *MicroInfo*; Norway's *Computerworld Norge* and *MikroData*; Saudi Arabia's *Saudi Computerworld*; Singapore's *The Asian Computerworld*; Spain's *Computerworld/Espana* and *MicroSistemas*; Sweden's *ComputerSweden*, *MikroDatorn* and *Min Hemdator*; the UK's *Computer Management* and *Computer Business Europe*; the U.S.' *Computerworld*, *HOT CoCo*, *inCider*, *InfoWorld*, *MacWorld*, *MICRO MARKETWORLD*, *Microcomputing*, *PC World*, *PC Jr. World*, *RUN*, *73 Magazine*, and *80 Micro*.

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How integrated software works.

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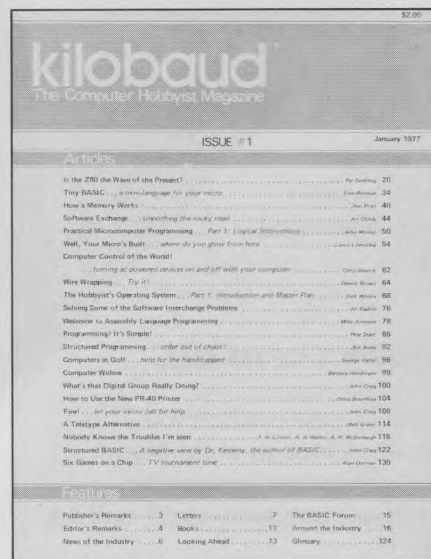
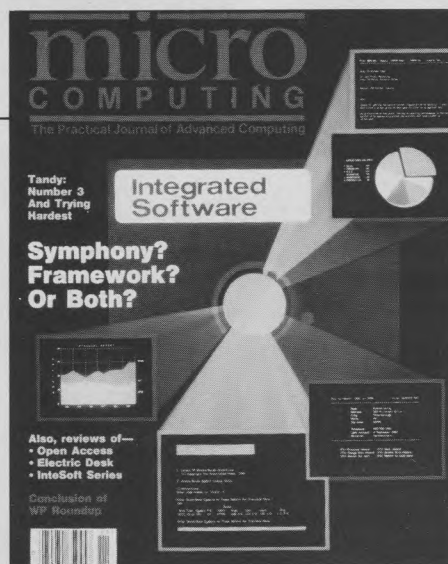
Personal Computer Software

Circle 285 on Reader Service card.

The Exit Mode

The End Of An Era

After 95 Issues,
Microcomputing
Calls It Quits



We've tried to think of a businesslike headline for this editorial ("Microcomputing Dead at 95; Second Oldest Computer Magazine Folds After 95th Issue"), but it hasn't worked. . .

Editorials are no place for emotional ranting, but we're talking about more than a business failure—we're talking about people, all the people who have read this magazine and worked in these offices since the first issue of *Kilobaud* in January 1977.

What Shakeout?

We'll spare you the details about MC's losing money and joining a half dozen other computer publications in the current shakeout. This editorial isn't about red ink and soft markets. As we said, it's about writers, editors and readers.

People have been reading *Microcomputing* for eight years—not long if you're *Time* or *Newsweek*, but an eternity in the computer world. *Kilobaud* was there at the beginning, with the soldering irons and mail-order motherboards; it was a pioneer for pioneers, a user's group in print.

KB not only reported on an industry, it helped to shape it. As ready-made micros followed the do-it-yourself machines, the magazine gave birth to spinoffs: *80 Micro* (which later begat *HOT CoCo*), *Desktop Computing*, *inCider* and *RUN*.

The Times They Are...

As specific micros and their magazines took off, the computer and publishing industries changed. Microcomputers are big business and pinstripes now: magazines aren't newsletters for loyal audiences but corporate ventures aimed at cash markets. We didn't need 1-2-3 to tell us we were in trouble. The figures simply didn't add up.

Last June, *Microcomputing* attempted a repositioning to adapt to the changing market. We feel each issue since then has improved greatly, but it may have been too little, too late.

We Ran No Review Before Its Time

In any event, the high editorial standards of this magazine re-

mained consistent to the end. Every magazine—particularly a computer magazine—struggles with the problem of scoop versus scope, a continuing dilemma of balancing deadlines with the depth of a story. *Microcomputing* never cut corners in reviewing products. A phrase like “company engineers tested over 100 software packages...to make sure each ran perfectly” wouldn't be found in *Microcomputing*. We ran our own tests and reported on those results; you deserved no less.

**People have been
reading MC for eight
years—not long if
you're Time or
Newsweek, but an
eternity in the
computer world.**

In light of that philosophy, we're particularly proud of our scoops—the HP 110, the Epson Geneva/PX8 and the HP plotters. We didn't catch the weeklies, but we beat everyone else with detailed information on the IBM PC AT. Our database expert Shawn Bryan was the first to break a major Framework bug to the industry. Our Macintosh coverage was more thorough and honest than most.

A Tradition of Being First

This kind of reporting is a long-standing tradition at *Microcomputing*. The industry-standard “Byte benchmarks” appeared first in *Kilobaud* in an article by Tom Rugg and Phil Feldman. The very first issue of KB featured an interview with Basic developer Dr. John Kemeny, and we interviewed 15-year-old *enfant terrible* Jonathan Rottenberg before he gained infamy as Boston Computer Society's moving force.

There's been a lot of ink spilled

over incestuous magazine/advertiser relationships. Yes, advertising is a part of any magazine, but we always aimed for editorial objectivity independent of advertising considerations. *Microcomputing* was an information source for computerists, not a catalog for shoppers.

Striving for Style

As editors, we believe the word's the thing. We worked primarily for a style that was honest, appealing, accessible, irreverent and informative. We could never have developed that style without the invaluable and exhaustive efforts of our authors. Many, many writers have been published in MC over the years; first and foremost is Frank Derfler, who in many ways epitomizes the editorial spirit of this magazine.

We're also indebted to Tom Bonoma for his IBM expertise, to Shawn Bryan for his prolific database details, to Ed Joyce and Phil Hughes for tackling difficult and technical subjects with clarity and flair, and to Chris Crocker and Mark Robillard. Of course, the host of free-lance writers who were the foundation of *Kilobaud* are also a part of the magazine's history.

More Than a Job

A magazine is more than editors—design, production, advertising sales and marketing worked hard for KB—but editors live with their magazine. We gave it our all.

It was the diversity of our editorial staff that made us strong—some of us are in our element writing assembly language programs and some are more comfortable wrestling with gerunds, appositives and the passive voice. We overcame some pretty tough odds to put out each issue. We're proud of each one, and we're proud of *Microcomputing* and of its contribution to the micro community. It's time to move on, but a piece of *Microcomputing* goes with some of us. □

The Editors

Letters

Still Too High

An eight-bit computer with 64KB and two drives for \$1000? Eric Grevstad's dream price structure that he advanced in his August "The Edit Mode" is still too high.

For example, the new Sinclair QL computer has a 32-bit processor with a DOS that includes windows and multitasking (as well as Basic), 128KB, two microdrives, standard keyboard, high-resolution, color, sound, bundled business software and more. Price? \$499.

Christopher C. Nystrom
Abilene, TX

Reply:

At this writing (August 20), the Sinclair also has no outside software, no U.S. distributor and isn't on sale. But your point is well-taken: I said my price forecasts were short-range ones, but I'm happy to see them being bettered already. Even if the TRS-80 Model 4P I sweet-talked from my dealer for \$1500 can now be had for \$949.

Eric Grevstad

Where's the QX-10?

First of all, let me thank you for an excellent magazine. It is the only computer publication that features a wide variety of articles and reviews. I especially enjoyed the article on the C programming language (August 1984).

I have owned an Epson QX-10 since December and I find it is an excellent machine. I have read that it is the most popular Japanese computer sold in the United States, but few magazines have reviewed it or published articles on it. A few software houses are making packages for it, and you reviewed a book on the QX-10 in your July issue, but these are scattered instances. Why does it take so long for a respected magazine

(such as *Microcomputing*) to recognize the Epson QX-10. All the reviews seem to center around the IBM and its compatibles.

I feel that the QX-10 should be given equal time in your magazine (and others). It is because I like the way the reviewers in your magazine go about reviewing a machine that I request a comprehensive review of the Epson QX-10 in *Microcomputing*.

Peter Hermann
Bow, NH

Reply:

Peter, we've already reviewed the Epson QX-10 in detail (see April 1983 *Microcomputing*, p. 66). In fact, we were the first industry magazine to offer an in-depth review of the QX-10.

We're glad you enjoyed *Microcomputing*. We, too, thought it was an excellent magazine.

Editors

Better Late. . .

This may be a little late, but did anyone ever catch the error in the solutions to the "Programming Problem" on p. 38 of May's issue? As the author stated, the purpose of saving a Basic program with the "A" option is so you can use a text editor or word processor to edit the program. Unfortunately, the solution (p. 129) shows using

SAVE "errfrag.bas",A

Personally, I don't know of any editors (under CP/M, anyway) that will be able to find a file whose directory entry is in lowercase, since it's always assumed to have been saved in uppercase, even if the keyboard input was in lower; however, most flavors of Basic will create the directory entry exactly as given, except that the extension (.BAS) is assumed if not explicitly given.

One more point—and this is important in a publication that

prints program listings or other finicky data—if the listings won't reproduce well just as they are, please print them in a simple, nonproportional font in which we can distinguish between Os and 0s, and between Is and 1s, and put them in wide enough columns so that the lines aren't broken; otherwise, the listings become hard to follow, and errors are introduced.

Table 1 on p. 38 (of the May issue) is an excellent example of this: although the space was actually wide enough to list the program without breaking lines, the margins are so wide that they had to be broken. Making things worse, the broken lines are filled with a lot of extra spaces between the words, which scatters everything. Since this is in a proportional font, it is hard to count commas or to distinguish them from decimal points.

These flaws mar an otherwise fine magazine.

Barry Klein
Beverly Hills, CA

Reply:

Your points are well-taken; however, it is too late.

Editors

One-of-a-Kind Product?

Edward Joyce's article on CP/M-80 software emulation (August *Microcomputing*, p. 20) made one critical error. The EM80/86 software package is not a one-of-a-kind product. Witness CPeMulator by U.S. Digital.

CPeMulator is a program that enables IBM PCs and Sanyo 550/555 systems to execute most programs written for CP/M-80 version 2.2. The program can also transfer files from Kaypro formatted disks to MS DOS disks.

Besides that oversight, I found the article most interesting.

Paul O'Brien
Portland, OR

Not Dow Jones.

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Overview

By Frank J. Derfler, Jr.

IBM Strikes Back With the PC AT

A Kilobaud Quiz— A Trivia Tribute To Days Gone By

Since my mission is to provide an overview on the microcomputing industry, this month I'll prognosticate on the impact the IBM PC AT will have on the industry. After that, I'll deal with the slightly mundane, but perhaps more practical, problem of how to make your house a comfortable computerized home.

Grizzly Attack

That bear is loose again! The IBM grizzly growled and charged when AT&T entered the market. Now, while everybody is patting Compaq on the head and admiring the new Corona systems, it turns out the bear was thinking of even smarter ways to drive the other predators off the range. The end of '84 is going to be a rough time for many PC clone companies. The PCjr is growing stronger, and now the PC AT has arrived on the range with speed and an appetite no one else has come close to matching.

IBM PC AT

The IBM PC AT boasts two significant technical improvements

over the standard PC: speed and memory addressing capability. On the day it was released, the original PC beat the performance of the best eight-bit machines in only one area: memory addressing. By this measure, the PC AT is a more significant introduction than the original PC. But other machines with better performance specifications came out at the same time as the original PC and didn't succeed—so there's more to success than technical specifications. The real question is, "What can you do with the machine?"

This is the first IBM microcomputer that can be used as a multi-user system and/or as a machine to run the Unix operating system. The 80286 processor in the PC AT is capable of cache memory operation that makes multi-user and Unix operation practical in a 16-bit machine. These two features are the heart of the PC AT's applications.

It can be argued that the larger memory addressing capability of the 80286 processor will allow machines to run software that provides better graphics presentation and fancy functions such as voice

recognition. I contend, however, that the memory in most PCs in use today isn't stretched by the available software, except for really large spreadsheets. The faster processing speed is valuable for operating-environment software such as DesQ, but speed alone won't make the PC AT successful.

However, the history of the computer industry clearly shows that good applications software comes slowly. Software that can really use the capability of a microcomputer usually appears a year after the release of the hardware. The PC AT is no exception. We'll run our standard PC software on the new machine and enjoy the speed, but the real power of the system won't be appreciated until the release of DOS 3.1 in early 1984 and the subsequent arrival of software that uses the features of the new operating system. The quality of DOS 3.1 will determine the future of Unix on IBM machines.

New Life for the Old PC?

Should you sell your old PC? Should you buy a new PC AT? The answers to those questions depend on what you want to do with

your computer. If you're happy with your present PC software (I still use an eight-bit TRS-80 Model II for word processing because it has fast response), then you probably shouldn't move away from a proven winner.

If, however, you're contemplating the installation of a local area network to give you shared access to data and expensive peripherals, then you might wait a little longer to see what DOS 3.1 looks like and how the Unix operating systems available for the PC AT are accepted.

If you want to use a PC for computer-aided design work, large database management applications or program development in the C or Fortran languages, then you should examine the AT closely. But if all you want to do is run Lotus 1-2-3 or any of your other software faster, you might be much better off using a coprocessor card with an 80186 in your present PC. Orchid Technologies has such a card available right now, and other companies are sure to follow with 80186 and 80286 upgrades for the older PC.

My bottom-line advice: unless you're sure the AT is what you want because of the company name behind it, I would wait. Wait for the new operating systems. Wait for the Unix wars to shake out. Wait to see what releases the AT&T and Convergent Technologies team make. If you're a user and not a software developer (or reviewer), I don't see any reason to hurry to buy a PC AT during 1984.

Computerized Living

Now I'd like to turn away from the battle of the corporate giants and turn to the home front. This month, I'll present an overview of the home information industry and describe how your microcomputer can truly become a part of your house. I'll also give you some hints that should help you to learn from

my experiences.

Wiring Your House

My family and I just moved into a new house. We've moved 12 times in the last 17 years, so this move wasn't traumatic. But it was interesting, because for the first time we were able to contribute to the design of the place we were moving into, even before the lot was cleared for construction. My interest, aside from the normal goodies like automatic garage door openers and a minimum amount of grass, was to provide as much of a prewired information environment as I could in the home. The things I ran into make a good illustration of the difference between information system theory and practical fact.

Planning

There I was, the great local area network and information systems guru, giver of seminars and expounder in print, faced with a set of blueprints and the knowledge that what I was planning was going to have to last, be complete and be built with my own money. I froze. I found that I really didn't know what I wanted to do, so I couldn't know what I had to install to do it. I had to fall back on my own best advice and define my requirements before selecting a system.

HAL at Home

Ideally, my dream is to wire my house so it responds like the HAL 2000 computer in the movies *2001* and *2010*. I want voice synthesis and voice recognition. I want status reports from sensors of various kinds located around the house and the ability to control environmental, security and entertainment devices from any room.

I don't think these ideas are unique or impossible. There are some excellent voice synthesis devices available, and good voice recognition systems able to react to about 100 different spoken com-

mands are also on the market. I can picture the programming code needed to do what I want to do, and I'm sure I could even write it in Basic, but the limitation comes in the areas of remote sensing, controlling and communicating. The equipment available today to do these tasks requires either a frightening mixture of wiring or an expensive assembly of digital devices, some of which don't yet exist in commercial form.

Theory and Practice

In theory, you can have little digital transceivers attached to the thermostat, hot water heater, doors, windows, television and other devices in your home that broadcast the status of the things they're attached to and accept commands in return. In theory, we can also land humans on Mars and bring them back, but we haven't bothered to develop the hardware to do either job yet.

Practically, modern homes contain a wide variety of electromechanical devices using proven technologies that everybody knows and understands. If you want to interconnect and control the pieces of any house you build today at a reasonable price, you might be better off installing pulleys and clockwork mechanisms rather than a local area network cable.

I'm not interested in having traditional computer terminals in every room of the house. I don't want to see anything that looks like a computer outside of the library where I write and do my reviews. I do, however, want to have the power of the computer available to me throughout the house.

Even though the software, and some of the hardware, to do this kind of job isn't on the market yet, I have faith that it will be. But, a few months ago I had to back this faith with a wiring design that will work when the other pieces become available. I finally decided to put as much wire into the walls as possible and hope that the right

medium is there when it's needed. This approach isn't very scientific or economical, but as the head of the Soviet Navy likes to say, "Perfect is the enemy of Good Enough."

Resistance to Change

Professionals in any trade often regard ideas about their field from someone outside as either dangerous or radical. Builders, electricians and security system people are no exception. When I told my builder I wanted him to run a piece of high-quality coaxial cable into every room of the house for a local area network, his attitude told me he thought I was more than a little bit crazy. He told me he thought it was probably against the residential building codes (it isn't); he said he couldn't guarantee that it wouldn't be damaged by the dry-wall construction (it was); and he said he'd only charge me \$50 for each "appearance" if I supplied the cable (ouch!). He also made it clear that his insurance policy wouldn't allow me to do the installation.

The coaxial cable I put into the walls of my house is a gamble. It's a high-cost item with little or no immediate use, but it could be highly useful in the future. The amount of cable that it took to do the job was three times my initial estimate. I ran a ring of cable that goes into and out of every room. This configuration should meet the need of any future sensor or actuator device that can operate on a bus system.

Off the Shelf

The local area network cable is the only wiring I installed that's not a standard option found in many homes, but the use of the other information system wiring must be carefully planned. Potential information media include the ac power wiring, intercoms, television cable and security systems.

The ac power lines can serve as a link between your computer and the power control modules manufactured by BSR and sold through

Radio Shack, Heath, Sears and other outlets. Heath has an RS-232C interface box that allows your computer to work with the BSR products to turn appliances with motors off and on and even to dim and brighten lamps by exercising control through the power lines.

BSR offers devices that connect to the telephone and allow you to control lights and appliances by remote control. But, as of yet, these control devices don't talk back. What we need is a family of small and relatively low-cost ac line communications devices that send status messages back to the controller or computer. These messages could be as simple as make/break for door switches, but a more expensive device able to measure voltage or heat would be valuable. The power lines run everywhere and have great potential for being used as home-control media, but we need two-way hardware.

Other Media

Intercom, telephone and security systems are reasonably priced when they're installed in a new or remodeled home. They also can serve as a good way to move information in and out of a centralized computer control system.

Some intercom systems still use mechanical switching to go between the receive and transmit modes, but some modern systems use electronic switching that should be easier to integrate with a computer's voice synthesis and voice recognition gear. I selected a NuTone model IM-3003 that combines many flexible features. I connected an Echo GP speech synthesizer into the auxiliary input port of the intercom system, and the computer can now talk to all of the rooms of the house, but as of yet it has little to talk about.

I didn't do as well with the telephone system. There are plenty of telephone jacks in the most commonly used rooms, but after we moved in, I found that more pairs of wires than the two included in

common house telephone wiring would have been useful. Both wire pairs are now occupied by telephone lines. Nothing is left to run any other sensors or controls or to use with a twisted pair local area network such as Fox Research 10 Net or Quadram's QuadNet I. If you're building or remodeling and have ideas like mine, I advise you to ask the company doing the internal telephone wiring to put a second run of wire beside the one it intends to use for the phones. It will be easier and much less expensive to do it right the first time.

The best investment I made from a practical and information system perspective is the home security system. The state of the art in security systems has improved greatly in the last few years. Most of these systems now use custom microprocessors, and they have several different modes of operation. The alarm company ran a pair of wires to sensors on every window and door and brought them back to a central point. Additional sensors include reliable infrared heat detectors and simple pressure switches under the carpeting. I paid extra to have the alarm company connect a multiconductor cable in parallel with the sensor lines and extend the cable to the computer room. Now, even if the alarm isn't armed, I can use the computer to sense the state of every window and door and to react in certain ways.

Fact and Fancy

At this point, you might be ready to ask, "But what do you do with this wired house system?" Things are just in development, but here is what it does now and what I hope to do in the near future.

When I get up in the morning and step on the mat concealed under the carpet in the hallway, the computer reads that sensor, reads its internal clock and tells me the time with a synthesized voice through the intercom system. Unfortunately, this wakes up everyone

else in the house and makes them angry, but it works.

The system can detect outside movement through the infrared sensor and, depending on the mode it's operating in, control various outside lights that I modified with BSR controller toggle switch devices. In the "party" mode, it turns on walkway lights. In the "security" mode, it turns on spotlights mounted under the gutters, and in the "work" mode, it will

turn on and off garage and storage room lights as people move through doors and activate sensors. The only problem with this application is that you have to go to the computer room and enter a program to control the lights. So far, I have some work to do before I challenge HAL 2000 or even R2D2.

Soon, I hope to implement voice recognition. My first experiments haven't been going well. The combination of audio mixing, speech

recognition training and programming is a heavy integration task, but I'll keep you informed.

In the meantime, if anyone out there knows of any little inexpensive networking devices that can monitor and control the status of appliances and other devices, please let me know. My home computer needs something to talk about. □

Contact the author at Box 691, Hendon, VA 22079.

Do You Remember the Early Years?

I could write sad words, but they aren't entirely appropriate. As the Exit Mode explains, this is the last issue of *Microcomputing* magazine, but sad words would ignore the fact that all along those of us writing in *Kilobaud*, *Kilobaud Microcomputing*, and *Microcomputing* have been heralding the microcomputer revolution.

Revolutions change things, usually the revolutionaries most of all. Our original readers have changed, and, simultaneously, the entire market for magazines dealing with microcomputers has changed. A monthly magazine that covers the general microcomputer field with a technical viewpoint has a tough time competing for subscribers against the specialized, weekly and free publications flooding the market.

The publishers of *Microcomputing* made a business decision based on the changed market I've been describing, so sad words would ignore all that we've said before. But if it isn't time for sad words, a little nostalgia is appropriate.

Have Fun with Sad

Nostalgia doesn't have to be sad—it can be fun. The popularity of the Trivial Pursuit board game and the demise of the second oldest magazine dealing with microcomputers gives me an excuse to play my own version of trivia, called "Do You

Remember?" I created the following test and I think it's worth taking, and as I put it together, a few interesting things emerged.

Observations

In this microcomputer revolution, the first years were simply fun. The years of 1975, 1976 and 1977 brought real progress in commercial microcomputer hardware, and the spirit of the industry was friendly and inquisitive. In looking back, 1978 was a year in which a few important products (TRS-80, Apple II and Commodore PET) made their splash, but little else happened.

History clearly shows that software always has followed, and apparently always will follow, hardware by 12 to 18 months. (There is hope for the Macintosh!)

I was fascinated to note that in 1979 the experience of successfully putting together a practical letter-quality word processing system was still worth writing an article about.

It's amazing how little credit the Heath/Zenith systems get for breaking new ground, considering how much they deserve. Heath/Zenith systems were among the first practical offerings in the micro marketplace.

The microcomputer revolution took place on both coasts. The East

had a corner on money and retailing skills. Apple benefited from the high-tech third-party user support it found in California. If Heath had been in California or if Radio Shack had been more open to third-party marketing and support, Apple might have died on the vine.

More early companies died than survived, but the people kept coming back. The reason for the demise of the small businesses almost always seemed to be the inability to handle growth.

The software aimed at micros using the CP/M operating system broke loose in 1980, and the industry move toward big business and real commercialism became apparent quickly after that.

In 1980, soldering irons and assembly language program listings were moved off desks and replaced with public stock offerings. Profit largely displaced fun and experimentation as goals, but that is just as it should be. The United States is the premier country of economic and social opportunity in the world. Our fun should become our business, and inquisitive people should become millionaires. But now, those of us who missed the millions but are still looking for fun will have to move on.

My monthly columns have appeared in this space since the Janu-

ary 1980 issue. Those five years of deadlines have been a bright spot even in the glitter of a reasonably successful career in Washington, DC. Thank you for your support.

Nostalgic Trivia Test

Here are some questions I have gleaned from my memory and the earliest issues of *Kilobaud* magazine. If you've been involved with microcomputers for a while, take the test and see how you do. If you haven't been around since the days of Imsai and Sol, then you might find the answers as interesting as the questions. After you figure your score, check your category of achievement in microcomputing trivia.

Do You Remember. . .

- 1) The original name of this column? (50 points)
- 2) The commercially marketed microcomputer that was wire-wrapped? (50 points)
- 3) The town where the cassette recording "standard" was established? (50 points)
- 4) The year of the cassette recording standard meeting? (75 points)
- 5) The microcomputer advertised with the color picture of the Starship Enterprise on the screen? (50 points)
- 6) The microprocessor preceding the 8080 in the Intel line? (50 points)
- 7) What state Southwestern Technical Products was in? (50 points)
- 8) The microprocessor used in the OSI Challenger? (60 points)
- 9) The price of the original Apple I circuit board (including 4KB RAM!)? (75 points)
- 10) The manufacturer of the KIM-1? (50 points)
- 11) The most common Teletype machine used as a terminal? (25 points)
- 12) The famous maker of memory boards with the name of an aquatic animal? (50 points)
- 13) The name of the cartoon pin-up (see Fig. 1) used to illustrate tri-tek ads (before we knew what sexist meant!)? (50 points)
- 14) The name of the creature living in 20 caves prone to earthquakes? (50 points)
- 15) The color of the Poly 88 Cabinet? (40 points)
- 16) The model number of the first Heath 16-bit microcomputer? (50 points)
- 17) The number of S-100 bus slots in the Vector 1+? (75 points)
- 18) The original name of the company that is now Hayes Computer Products? (25 points)
- 19) The year Tandy opened its first computer store? (50 points)
- 20) The unique material included in the SOL 20 cabinet? (50 points)
- 21) The year of the first West Coast Computer Faire? (75 points)
- 22) What early S-100 motherboards lacked that made them "noisy"? (25 points)
- 23) The model number of the first Heath terminal? (25 points)
- 24) The nomenclature of the bus system used by the PET? (25 points)
- 25) What PET stands for? (50 points)
- 26) The price of the TRS-80 Model I system with recorder, 4KB RAM and monitor? (50 points)
- 27) The Tinker Toys logo? (25 points)
- 28) The Dallas, TX, electronic parts company with a two-letter name? (50 points)
- 29) A computer company named blank blank Broadcasting? (50 points)
- 30) The names of the two bread-board systems that led directly to the Commodore PET? (100 points)
- 31) The name of the first computer magazine on a cassette? (25 points)
- 32) The name of a unique mass storage device called the Exatron (blank) Floppy? (25 points)
- 33) The name of the eight-inch disk system for the SOL-20? (75 points)
- 34) The name of the first practical (?) color video card, from Cromemco? (50 points)
- 35) The processors used in the OSI Challenger III? (50 points)
- 36) The first ASCII keyboard for a single hand? (50 points)
- 37) The name of the author of Electric Pencil? (50 points)
- 38) What feature did the TRS-80 Model I Level II add to the keyboard? (25 points)
- 39) How many processors were in the H89 and what were they? (50 points)
- 40) The name of the most common lowercase board for the Apple II? (50 points)
- 41) The name of CompuServe's first service for computer hobbyists? (50 points)
- 42) Ward Christensen's partner who did the hardware for the Chicago Computerized Bulletin Board System? (50 points)
- 43) The Apple communications guru whose last name is a color? (50 points)



Fig. 1. What does this woman have to do with computers? See question 13.

Overview

- 44) The TRS-80 guru and author of a series of books ending with the phrase *& Other Mysteries?* (25 points)

Check Your Score

- 1500–2000 points: A certified microcomputer pioneer.
- 1000–1500 points: Highly experienced micro guru.
- 500–1000 points: Novice: You probably believe the Apple ads saying they invented the personal computer.
- under 500 points: Neophyte: You probably believe IBM invented the personal computer.

1. Dial-Up Directory
2. Wavemate Juplter
3. Kansas City
4. 1975 (If you were there, add 1000 points.)
5. Compucolor 8001
6. 8008
7. Texas
8. 6502
9. \$666.66 (If you owned one, add 1000 points. If you ever even saw one, add 50 points.)
10. MOS Technologies
11. Model 33
12. Seals Electronics
13. Ample Any (No bonus points, just memories)
14. The Wumpus
15. Bright Orange
16. H11 (If you said Z-100, deduct 500 points)
17. 18 slots
18. D.C. Hayes Associates
19. 1978
20. Wood (Walnut, to be exact)
21. 1977 (170 exhibitors and 14,000 attendees)
22. Terminating resistors there.)
23. H9
24. IEEE-488
25. Personal Electronic Transactor
26. \$599
27. A lightbulb
28. S.D. Computer Products
29. Smoke Signal Broadcasting
30. Jolt and KIM (Developed by Chuck Peddle)
31. CLOAD
32. Exatron Stringy Floppy
33. Helios (and the SOLOS operating system)
34. The Dazzler
35. 6502, 6800, Z80
36. The NewO Writehandler
37. Michael Shrayer (He's back!)
38. Numeric Keypad
39. Two Z80s
40. Dan Paymay
41. Micronet
42. Randy Sues
43. Bill Blue
44. H.C. Pennington

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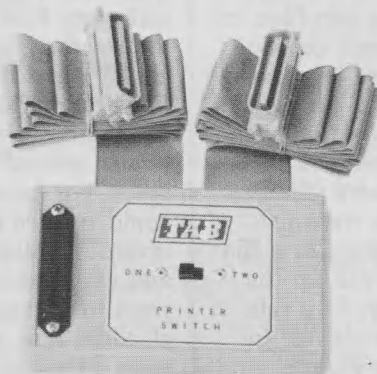
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The Database Manager

By Shawn Bryan

How to Relate To Relational DBs

TIM IV
And Dataflex
Two Up-and-Comers

Advertisements for relational database managers abound these days. Many companies are trying to capitalize on the wish to own the latest technology.

Relational systems are fairly new. The initial theories on relational systems were published in the early 70s. Last month I said that the major categories of database management are models upon which systems are built, and the relational model is really quite a simple one.

Relational Model

To refresh your memory, file managers normally work on only one file at a time. Each record in the file is a complete one, containing all the information you've put in and can take out. The relational model views data much like a file manager, but it goes one step further. One thing must be available that's not required in a file manager: a redundant or key data field, or attribute, by which relationships can be described.

Think of two separate, but related, databases. The first has cus-

tomers name and address information and assigns a customer number. The second has your customer history information in it. You can relate the customer history to the customer address by adding the customer number to the customer history file. This provides a unique field in each file that's used to tie the files together when necessary. If you want a list of all customer addresses and their total orders to date, you can retrieve that information with one pass at both files. That's the other key to relational systems—you can work on more than one file at a time. In some systems, it's only two files; in others, there are no limits on the number of files that can be opened simultaneously.

What's the advantage of working this way? First, it allows you to segregate data in the way you'll normally use it. If you want to change a name or address in a file manager, you have to call up the entire customer history. In a relational system, you can change information in one file without opening the related files. This speeds your data access and re-

duces your chances of inadvertently changing information not presently being used.

The drawback to relational systems is that the connection between files must sometimes be artificial. You may not have any way of relating files except to add a field that you normally wouldn't place in a file. If your customer information file wouldn't normally include a customer number, you're going to have to add it so you can relate the customer file to the name and address file.

You must be aware of this requirement before you begin to design your files so that each file has the required key field. In some cases, where three or four files must be related, you may have to create an entirely artificial file that relates several fields to one another. For example, a business could require files of parts kept in inventory, customer history, names and addresses and salesmen. If you want to extract information from all these files at once, to relate sales, salesmen, inventory and customer information, you create an artificial file containing salesman

number and customer number and no other information. This creates a relationship between the two by using a third file. This need for artificial file management gymnastics is one of the drawbacks to relational systems. You don't have these constraints in the real world so you have to adapt your thinking a little in the database world.

Data Manipulation

Getting information out of relational systems is a little more complicated than it is with file managers, where all the fields are read every time a record is retrieved. Relational systems often depend upon a programming language for data manipulation. dBase II is a good example of a lower-level language. It is complicated and requires some expertise for creative use.

dBase II uses a type of relational algebra that, in its simplest form, requires you to create new files that are subsets of the original, or master, files to obtain data from your files. The record selection and reporting techniques are not dynamic.

Another way of extracting information from files has become more popular in the last several years. This method uses relational calculus to permit more natural data queries. One of the most widely used examples of relational calculus is found in IBM's SQL (Structured Query Language, often called sequel), a mainframe language used for near-English data inquiry.

Instead of requiring the creation of data subsets, relational calculus permits dynamic requests of the database. Microrim's R:base and Microdata Base Systems' KnowledgeMan are two good examples. In these two programs, you can retrieve a sorted data listing without creating a separate file. Further, in KnowledgeMan, you can build sophisticated commands into a request that permits complete data retrieval in one pass, with logical and relational operators all in-

cluded in a single request. This is where relational systems really gain in flexibility and power over their poorer cousins, the file managers.

More Relationships Possible

One other feature of relational systems makes them inherently more complex than file managers. As in the real world, more than one type of relationship is possible between files. Files may have a one-to-one relationship, where the key field for two records is the same (as in a Social Security number used to tie an employee address file and salary history file together).

Files can also have a one-to-many relationship. An example of such a relationship is a car dealership file where the manufacturer is a key field in the address file, but the inventory file uses car model as a key field. A manufacturer may have many models of cars, but each model car has only one manufacturer.

Finally, and most complicated, are the many-to-many relationships. In a many-to-many relationship, each record of the related files has many possible matches in the other files. You extract meaningful data from such files through the creation of an artificial file for the sole purpose of making a more definable relationship between the other files possible. If this sounds complicated, it is. I recommend reading *Data Base Management Systems* by A. Cardenas, a classic work on database management, if you wish to pursue this theory further. A second edition of this book was released in July by Allyn & Bacon Inc., 7 Wells Ave., Newton, MA 02159.

What to Consider

What should you look for in a relational system? Most of the cautions from last month's column apply. The program should be able to handle the largest files and fields you can anticipate. It should run in a language compatible with

your system language, word processor and so on. The manuals and the tutorials should make you comfortable with the program. The company should offer dependable support and should have a clearly explained upgrade policy.

If you intend to design your own system, test out the program for a time to make sure you're comfortable with its design. If you aren't sure you want to design your own system, let the designer you hire recommend several programs before making any final decisions. Find out who else is using the same system and how well it's working. How many installations have been done in your area? Are the customers pleased? Reputable designers are pleased to furnish references.

Now for a look at two database managers: a popular file manager and an up-and-coming relational database manager. TIM IV has received a lot of attention lately as an easy-to-use file manager with some relational "tricks" on data retrieval. Dataflex is a systems development program that offers flexibility in systems design and uses a powerful programming language for data manipulation.

TIM IV

TIM IV is the brainchild of Innovative Software of Overland Park, KS. It's a new release of a program called TIM that's been around for some time. TIM IV offers a few new features and has capitalized on several years of user feedback, so it's user tested and debugged. It works well and has some fascinating features.

TIM IV isn't copy protected. Making backups of the program is simply a matter of copying the program files to DOS-formatted disks. The program requires two disks. Some disk swapping occurs when using TIM IV, but the swaps are required only when you're changing functions and will probably be in a different functional area for

some time. The program is written in compiled Basic and runs reasonably fast.

The TIM IV manual is organized in the same order that menus for TIM IV appear. Each menu selection appears as a tabbed section of the manual. The manual and the help files on disk, coupled with a set of sample files and a tutorial section, make learning TIM IV a pleasurable and profitable experience. Trauma is reduced to a minimum. The entire package is put together well.

Nice Touches

Some nice features show the touch of a mature program. For example, an inverted field option allows you to enter names first-name-first but searches for data in that field last-name-first; that is, it reads the field in reverse order when it's time to search for data.

When you first start using the program, menus help lead you through it. After you've gained experience, you can skip many of the menus by using slash (/) commands, much like VisiCalc. Again, this is the touch found in a mature program. Being able to avoid the menu delay is a real plus for any program. The approach used by TIM is natural to computer users already using 1-2-3 or VisiCalc.

Creating files in TIM is easy. Start by naming the file when the menu prompts you. You must enter a DOS filename of eight characters. Following the entry of a legal DOS name, you may enter a comment of up to 60 characters to describe the file. This is another nice touch since eight-character filenames soon lose their distinctive identity when you define a number of files. Next you can enter a four-character access code (or password). Then the field definition screen appears.

The field definition screen has room for 20 fields at a time. You can define up to 40 fields for each record, and each field can be up to 60 characters long. The maximum

For ease of use, TIM IV earns high marks. The manual and tutorial are excellent.

for any record is 2400 characters. The screen has columns for field title, length, type, information on whether or not it's a key field and, if it's calculated, room to designate the equation. Field types can be alphanumeric, date, numeric, total, calculated, inverted name, sequentially numbered and dollar.

Numeric precision can be designated from one to four decimal places. Once you define the fields, you can design a data entry screen using the preferred draw-on-the-screen technique. If you don't have any fancy formatting desires, you can designate a standard screen, which will result in the fields being listed one after the other on the screen. If you want to be creative, you can designate a custom screen. You're given a blank screen upon which to place your fields.

If you want to copy an existing file structure, TIM permits you to do that. You then fine tune the file by modifying the fields or screens that need work. This saves you a lot of repetitive work if you have two similar files, and it shows forethought on the part of the program's designers.

Happy Tinkering

TIM IV has several features that aren't particularly flashy but will make tinkerers happy. The Basic programs are provided in the manual that make the creation of interfaces to TIM easier. The sample programs are well-designed and offer a good look at how TIM can be used. But some things are lacking, too.

The program is too rigid in its

data entry screen creation. The program lines up all the fields you design in a column for you if you don't want to design a data input form, but nothing lines up well. The input fields immediately follow the prompts. What results is a split-rail fence of input fields zigzagging across the screen. If you want to use a special input form, you can design one. But you can have only one, and you can't have anything on it but the field names and field input lines. No additional prompts, footnotes or comments are allowed. That isn't the way I work, and I don't like to be circumscribed, especially when it comes to explanatory comments on an input screen.

Putting information on paper with TIM is more work than it should be. TIM has two basic types of printing format: list and report. A third type, the quick print of a file, is a sequential listing of a file's content, useful if you want a quick look at what a file contains without regard for formatting. The list function creates reports that appear on more than one line like mailing labels or forms. With the file list function, you can place information around the page where you want it to appear, but you can't do any work with it, such as totaling fields or performing other calculations on the data. A list in TIM is just that, a list with no other options available.

A report in TIM is what I call a list. It's a columnar report with each record occupying a single line, much like a spreadsheet. Here you can total fields, enter various break levels and sub break levels, and link files together for a relational report. Again, I'd be a lot happier if I had more flexibility in the way I could use the input and output functions of the program.

The Bottom Line

What's the bottom line on this program? It's an adequate database manager. It has some relational reporting features that make it more

attractive than just a file manager, but it still has too many limitations on both input and output to be on my most-favored list. To its credit, the program is a tinkerer's delight, with lots of nooks and crannies to be discovered and used.

Many nice features speak well of Innovative Software's listening ability. It's obviously taken some pains to implement some of what its users have said. TIM is bug-free, at least as far as I can tell. This shows its maturity and means that the data you put into this program probably won't get lost.

For ease of use, TIM IV earns high marks. The manual and tutorials are excellent. Enough information is available to make advanced users happy as they poke about in the program, yet there's still plenty of basic material available for the novice. If the input and output constraints aren't a problem for you, then TIM is worth serious consideration. If, however, being able to do creative work with input and output is high on your priority list, I suggest you look for a more flexible program with more options for formatting screens and reports.

Dataflex

Dataflex is the other victim of my attempt to break programs this month, and it's emerged a real winner! It surprised me because Dataflex has kept to itself until its recent spate of advertisements. It's written in Pascal/MT+, an unusual language choice. (I've found few database management applications written in Pascal.) After a somewhat shaky start (the documentation is the program's weakest point), I'm pleased to report that this is a serious program with many fine features for the database management professional.

Not a Toy

Note my choice of words. This program isn't a toy, and context-sensitive help screens and other amenities are unheard of. But brute

power is here aplenty, and programming payroll systems, general ledger systems and the like are clearly the target for this program.

Dataflex comes in many shapes and sizes. It runs on every conceivable micro and works in a multi-user environment as well as on single-user systems. The people at Data Access Corp. of Miami, FL, provide a preview of what this system is all about on the manual cover. It reads "Dataflex Applica-

tion Development Software." This isn't a menu-driven, easy-to-use program for quick and dirty reports. It isn't for the business manager who wants a simple, easy-to-use program to learn in a few hours and use proficiently within a few days. This is a program for more sophisticated computer users designing software for others or for their own in-house applications. It offers flexibility, speed and power with unlimited formatting of

Dataflex Command Groups

Console I/O Group	Handles screen and keyboard I/O functions.
Control Group	Handles the abort, chain, debug, error, goto, gosub and other control commands.
Data Base Group	Includes the attach, clear, delete, find, open, relate and other database commands.
Definition Group	Includes the date, indicator, integer, number and string commands.
Element Processing	Includes commands to process data elements, e.g., increment, move, movenum, moveint.
Enter Macro Group	Includes endgroup, entdisplay, enter, enterend, entergroup and entry commands.
Forms Group	Includes numerous commands used by Dataflex to handle forms creation and manipulation.
Indicate Group	Used to retrieve the status of flags such as ifnot, indicate, if and ifchange.
Key Group	Includes backfield, entagain, entermode and keyproc.
Multi-user Group	Despool, lock, reread and unlock are included and compiled under a single-user system but not executed.
Report Macro Group	Used to control printer output.
Sequential I/O Control	Handling of sequential file I/O.
String Group	Used to control string operations, including mid, left, right, trim and so on.
Structured Control	Includes the commands begin, end, for-from-to-loop, repeat-until and while-end.
System Group	These commands provide DOS-like functions within Dataflex.

Table 1. Dataflex's 15 command groups, each relating to specific programming actions available.

reports and input screens, relational file structure (at least ten files can be used at once), and a language rivaling anything available.

On the IBM PC, you'll need to use a system configuration file to tell the computer you want it to look like an ANSI standard terminal instead of the usual IBM. You do this by putting a file called CONFIG.SYS on the program disk that contains the following command: DEVICE=ANSI.SYS. This activates a set of extended screen and keyboard handling sequences not normally available. Dataflex needs to have the ANSI.SYS file installed before you try to run it if you're using DOS 2.0 or higher. (See Chapter 13 of the DOS 2.0 manual for an explanation of the ANSI.SYS character sequences.) If you don't install this, the screen looks more like hieroglyphics than text. If you're unfamiliar with the configuration of your system, you may have some problems because the people at Data Access assume you're competent with the basic DOS commands. For their target audience, that's a fair assumption, but be aware of this assumption before you begin.

The version of Dataflex I used is 2.0e. The manual is written for 2.0. To avoid a complete rewrite, Data Access placed a series of change pages with the update information at the front. This systems works, but I prefer to have the information in the text where you actually use the reference. That way you don't inadvertently miss a change. I suggest you note the changes in the manual in the appropriate places.

Now You Begin

Now that you have Dataflex running, you can begin the tutorial section of the manual and program. A sample application comes with the program, and the manual leads you through it, expanding the information provided until you're exposed to most of the commonly used operations in the program.

Perhaps the strongest selling point for Dataflex is its multi-user capability. Its weakest area is documentation, but even that isn't as bad as some I've seen recently.

Getting started with Dataflex is deceptively easy. The form for data entry, called a screen image, is created using paint-on-the-screen techniques. You can place descriptive information, comments and notes anywhere you like and create multiple screen images or pages.

Dataflex uses the term data window to describe the area on the screen where data entry takes place. Data can be ASCII (characters and letters), numeric and date. You can design your input forms with the editor in Dataflex or with some other editor. (You can use any editor that creates an ASCII file.)

Creating the input form, and thus the database, takes two steps. First, you define the screen as you want it to look. Then you compile that ASCII file into something the program can use with the Autodef program. Autodef reads the ASCII file you've created and prompts you for information about the data fields. It then creates a configuration source file that can be compiled for use. All files being used by Dataflex for input, output or data manipulation must be compiled before they'll work. This is a function of using Pascal for this type of application.

Why So Difficult?

Once you compile the data input form, you begin data entry. As I said, getting started is deceptively easy. Creating output forms, or reports, is just as easy as creating input forms. The process is similar.

Why do I say this program is so difficult to use? The skill and experience are required in the middle, between data input and data output forms. The command language of Dataflex comes into play, and it's here that most novices use only a tenth of the power available. If you spend the money for this type of program, you should learn to use all its features—a formidable task.

The Dataflex language consists of 15 separate command groups (see Table 1). Each group relates to a type of programming action available in Dataflex. For example, the database group has commands to open, save, attach, clear and delete databases. Each of the commands in this group relates to the management of databases in general and allows you to control some aspect of the database you're using. The string group consists of a series of arguments and commands that deal with data strings. Append, pad, mid, trim and so on, all give you ways of dealing with strings.

Many of the commands will appear familiar to Basic programmers because some of the syntax is similar, but Dataflex offers more flexibility and more commands than Basic for the kinds of manipulation used in database management. Many of the commands in Dataflex accomplish with one stroke what requires a string of statements in Basic.

Use Your Text Processor

Creating a command file in Dataflex is simple because you use your favorite text processor to do the work (as long as it creates ASCII files). Once you create a file with the editor, you compile it into a file that Dataflex can use. This has

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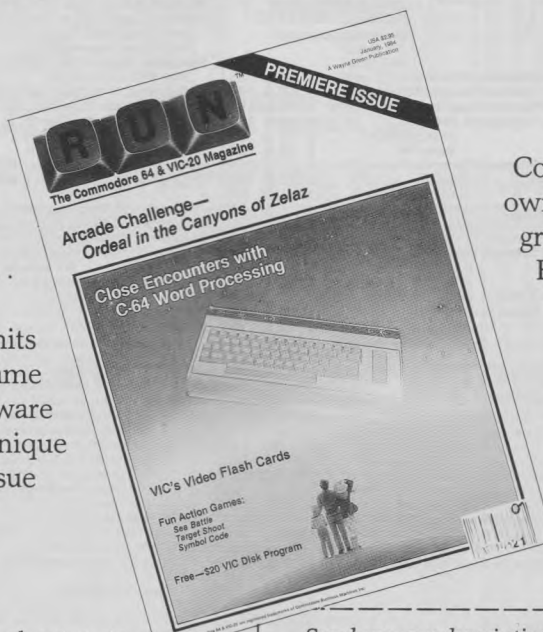
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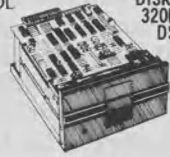
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By Edward Joyce

Choosing Between Hamburger and USDA

A Roundup Of the Best Breed Of Assemblers

As unlikely as it may seem, rounding up assemblers is like rounding up cattle. You start by canvassing the pastures of computerdom searching high and low for the assembler breed of programs. It's an uncommon species, but machine code generation, conditional directives and macro capabilities set assemblers apart from the rest of the herd. Next, you corral the critters into one pen and methodically brand each shrink-wrapped package.

Dyed-in-the-wool ranchers can grade beef on the hoof just by eyeballing the beast. Likewise, seasoned programmers can gauge a choice assembler fairly accurately by perusing the user's manual. In most cases, the manual highlights the software's flexibility, power and robustness.

But by and large, the acid test of sizing up a steer or an assembler is performance. You strut the beast around the pen, check its stature, note its finesse. Meat packers don't bid on cattle that crawl on their knees. Likewise, programmers don't buy assemblers with benchmarks that barely edge out an Ada compiler on a Commodore VIC-20.

To separate USDA choice from hamburger, I rustled up half a dozen assemblers and put them through the paces. Individual reviews follow describing the fine and not-so-fine points of each software package. The accompanying comparison chart summarizes the salient qualities of each package.

This roundup evaluation focuses on Z80 assemblers that execute under CP/M-80 version 2.2 and produce code for that environment. There are other CP/M configurations, but the Z80 systems rank as the most popular of them all—at least for the time being.

Part 1 of the roundup appears here with reviews of three assemblers. In the next issue of *Microcomputing*, I would have evaluated three more.

Z80ASM: Prime Rib

Initially, I had my doubts about Z80ASM from SLR Systems. I'd barely cracked the user's manual when the clumsy command line precedent established by Digital Research's ASM assembler confronted me. Namely, the drive parameters for the source, object

and listing files go where the file extension usually appears.

For example, to assemble the source file TEST.Z80 on drive A and direct the object and listing files to drive B, you type Z80ASM TEST.ABB. The extension of the file is always assumed to be Z80.

Speed and Flexibility

Fortunately, the command line format is about the only thing SLR's assembler shares with its Digital Research counterpart. In other areas, it stands head and shoulders above ASM and most other assemblers. If I had to summarize SLR's assembler in two words, I'd say speed and flexibility.

The flexibility asset surfaces at the onset when you configure the software. The configuration program controls the settings of more than 25 default parameters. These range from inclusion of time and date on listings (for CP/M Plus environments) to extensions of input and output files to page width and length.

My two favorite configuration options are error limit and error paging. Error limit sets a cutoff point for a maximum number of

errors. If that limit is reached, the assembly is terminated. This option comes in handy for arresting the domino effect, which occurs when one error causes a cascade of errors, such as one missing macro library include statement generating a stream of undefined operation code errors.

The error paging option specifies a maximum count of errors displayed on the console screen before pausing for operator intervention. Displaying error messages on the console screen is of little value if they flash by at breakneck speed. This count stops the display in its tracks and waits for you to signal continuation. While assembling a program, you no longer have to hover over the keyboard, left hand poised on Control-S, to avoid missing critical messages.

Buckle Your Seatbelt

Once you've tailored the assembler to your personal *modus operandi*, you're ready for a test drive. Before you take off, I suggest buckling your seatbelt. This program doesn't bill itself as "super fast" for nothing!

The benchmarks in the comparison chart support the speed contention. Z80ASM assembles the Sieve of Eratosthenes program shown in Listing 1 in less than half the time it takes other assemblers. It also undercuts Digital Research's MAC assembler, which clocks in at 53 seconds to produce a Sieve .COM file.

Part of the turboperformance stems from the fact that the load step is eliminated completely. Programs such as Digital Research's ASM and MAC generate .HEX files that subsequently must be fed into the Load utility to produce .COM files. Z80ASM directly generates the .COM file. This shortcut saves 11 seconds, the time required to execute Load, in the Sieve benchmark. (Z80ASM can also be directed to generate a .HEX file, if you so desire.)

Another major time saver accrues when you make multiple as-

Now you're ready for a test drive, but before you take off with Z80ASM, I suggest buckling your seatbelt. This program doesn't bill itself as "super fast" for nothing.

semblies. Z80ASM offers an interactive mode analogous to the PIP utility program. You can assemble a batch of files without reinvoking the program. Multiple assemblies can also be specified on the command line. For instance, the command line "Z80ASM SIEVE,DUMP,BOIS" assembles three files in one fell swoop.

Several of the product's less prominent features become apparent when you examine a listing. Referring to Listing 1, which was created by Z80ASM, you see that both upper- and lowercase characters are supported. This is a refreshing change from the assemblers that insist on converting everything to uppercase, blurring the distinction between instructions and comments.

The values of equates (EQU) and define space (DS) directives are indented slightly to set them apart from data and instruction codes. Software jocks probably won't invest in the package based on this point alone, but it exhibits the attention to detail that guided the system's developers.

Notice also that 16-bit values are printed in logical order. The code for statement 46, the CALL BDOS instruction, appears as CD 0005 instead of the usual CD 0500. During configuration, you have the choice of ordering these values either way. The former makes it easier to read—you don't have to mentally flip the bytes to identify an address. However, the latter reflects

the actual image in memory. In any case, flexibility reigns again, giving you the choice.

When forming instruction operands and expressions, you choose from a rich assortment of 22 operators. These include division, multiplication, shifting, and logical And, Or and Exclusive Or.

The printout in Listing 1 concludes with a routine cross-reference. For the Sieve program, generating a cross-reference adds no discernible overhead to the benchmark, a feat matching the often promised but rarely delivered free lunch. My only suggestion would be to distinguish label references from label definitions by posting an asterisk next to the statement numbers of the definitions.

Overall, Z80ASM lives up to its self-appointed sobriquet of "super fast development package for software entrepreneurs." To support my observations, I called Ed Mitchel, a programmer at Industrial Computer Equipment Corp. "We've been using Z80ASM since September of 1983," Mitchel explained. "At the time, I was looking for a mainframe-caliber development tool, and I almost gave up in disgust [until] I chanced upon SLR's program."

"The system cut 20-minute assemblies to six minutes and in a one-year project, paid for itself 100 times over."

"Do you have any complaints?" I asked.

"Yes," Mitchel replied. "Only that it wasn't available three years ago."

Need I say more?

ASMZ80: Where's the Beef?

Reviewing the RELMS (Relational Memory Systems) ASMZ80 assembler, like the SLR system, was another case of being betrayed by initial impressions, but of a different sort. For \$395, I expected a sophisticated development tool—maybe a micro version of the IBM Waterloo mainframe assembler. Alas, the

Listing 1. Sieve of Eratosthenes prime number benchmark coded for the Z80 microprocessor in Zilog mnemonics. This program performs ten iterations of calculating the 1899 prime numbers between three and 16,381.

```

1      TITLE 'Generate Sieve of Eratosthenes Primes'
2      ORG 100H
3
4      ; Equates.
5      CR EQU 0DH ; carriage return
6      LF EQU 0AH ; line feed
7      BDOS EQU 0005 ; BDOS entry point
8
9      ; BDOS Function Calls.
10     0009 PSTRING EQU 9 ; print string until '$'
11
12 0100 C3 2171 JP START ; skip around data
13
14 0103 OD 0A 0A 31 BGNMSG DB CR,LF,LF,'10 iterations',CR,LF,LF,'$'
15
16 0117 OD 0A 0A ENDMMSG DB CR,LF,LF
17 011A 0004 PRIMES DS 4
18 011E 20 70 72 69 DB ' primes',CR,LF,LF,'$'
19
20 0129 0040 DS 64 ; reserve 32 stack levels
21 0169 EQU $
22 0169 0002 SAVESP DS 2 ; saves system stack pointer
23
24 016B 00 ITER DB 0 ; counts iterations
25 016C 0000 COUNT DW 0 ; counts primes
26 016E 0002 PINDX DS 2 ; points to prime multiples
27 0170 0002 PRIME DS 2 ; prime number
28 0172 1FFF FLAGS DS 8191 ; indicates integers between
29 ; 1 & 8191 that are prime
30 ; 0 => not prime
31 ; 1 => prime
32 1FFF FLAGLEN EQU $-FLAGS ; length of FLAGS
33
34
35
36 2171 ED 73 0169 START LD (SAVESP),SP ; save system stack pntr
37 2175 31 0169 LD SP,STACK ; set up local stack
38 2178 11 0103 LD DE,BGNMSG ; DE -> message
39 217B 0E 09 LD C,PSTRING ; greet operator
40 217D CD 0005 CALL BDOS
41
42 2180 21 0172 NXTITER LD HL,FLAGS ; initialize FLAGS array
43 2183 36 01 LD (HL),1 ; set first byte of move
44 2185 11 0173 LD DE,FLAGS+1 ; DE -> destination
45 2188 01 1FFE LD BC,FLAGLEN-1 ; BC <- length of move
46 218B ED B0 LDIR ; BC now = 0, use as
47 ; FLAGS array index
48
49 ; Check element in FLAGS array.
50 218D DD 21 0172 CHKELEM LD IX,FLAGS ; IX -> base of FLAGS
51 2191 DD 09 ADD IX,BC ; check element in FLAGS
52 2193 DD 7E 00 LD A,(IX+0) ; A <- FLAGS element
53 2196 60 LD H,B ; HL <- FLAGS index
54 2197 69 LD L,C
55 2198 B7 OR A ; prime?
56 2199 20 11 JR NZ,FNDPRIM ; yes
57
58 219B 11 1FFF NXTELEM LD DE,FLAGLEN ; end of array?
59 219E ED 52 SBC HL,DE ; carry known to be 0
60 21A0 28 48 JR Z,ITERDON ; yes--next iteration
61 21A2 79 LD A,C ; no--increment BC,
62 21A3 C6 01 ADD A,1 ; index to next element
63 21A5 4F LD C,A
64 21A6 78 LD A,B
65 21A7 CE 00 ADC A,0
66 21A9 47 LD B,A
67 21AA 18 E1 JR CHKELEM ; check next element
68
69 ; Found prime.
70 21AC E5 FNDPRIM PUSH HL ; yes--save index
71 21AD 29 ADD HL,HL ; index to multiple
72 21AE 11 0003 LD DE,3 ; PRIME = index+index+3
73 21B1 ED 5A ADC HL,DE
74 21B3 22 0170 LD (PRIME),HL ; save prime
75 21B6 D1 POP DE ; DE <- index
76 21B7 19 ADD HL,DE ; PINDX = index+prime
77
78 21B8 22 016E ZAPMULT LD (PINDX),HL ; set multiples non-prime
79 21BB B7 OR A ; clear carry
80 21BC 11 2000 LD DE,FLAGLEN+1 ; end of array?
81 21BF ED 52 SBC HL,DE
82 21C1 30 18 JR NC,INCCOUN ; yes
83 21C3 DD 21 0172 LD IX,FLAGS ; no--indicate non-prime
84 21C7 ED 5B 016E LD DE,(PINDX)

```

Listing continued.

sophistication of ASMZ80 ends with the price.

Your disappointment begins when you unwrap the documentation from RELMS. The 100-plus pages are delivered loose-leaf form, sans binder. The descriptions contained within the assembler, linker and relocater rate no higher marks than the physical packaging.

Parts of the user's manual just break your reading rhythm, such as the reference to "reversed" words (meaning reserved words?). Other sections are flat-out wrong. The license agreement, for example, spells out a procedure for backing up the distribution disk using a supplied program called DGEN. DGEN was nowhere to be found, and, as the vendor later admitted, doesn't even apply to the CP/M version of the assembler.

The description of the title directive says that title headings may be up to 50 characters long. The program acted to the contrary, truncating my titles at 40 characters.

More Mistakes

Another fallacy was the sentence, "A four-byte patch area is generated when encountering a blank line or assembler directive." I re-read that statement several times, wondering if such a patch area should be classified as a feature or bug. Then I considered removing the generous sprinkling of blank lines I had in the Sieve source code for delineating different logical parts of the program. But a quick experiment showed that blank lines and directives generated no code, so I annotated that clause as another case of the manual missing its mark.

When the manual does tell you something correctly, it resorts to overkill. Two nearly identical back-to-back sections describe the command line format. I was forced to check the page numbers to see if a set of pages had been duplicated inadvertently. But the page numbers checked out—I suppose two

sets of redundant instructions are better than none.

By this point in the evaluation, you're convinced that your four-C-note investment didn't go for a Pulitzer Prize-winning user's manual, so you look to the software for comfort. I invoked the program to check for an interactive mode. ASMZ80 responded with the informative message, "ERROR 0023 USER PC 047B9H." A little leafing through the manual lead to a translation in Appendix F citing error 23 as "no filename specified for a disk file." In other words, you must specify the input filename on the command line. No explanation was offered for the USER PC phrase, something I figured was meant for an elite, handpicked audience like the encrypted expiration codes found on cereal boxes in the supermarket.

The curt, coded flavor pervades ASMZ80's diagnostic messages. The messages are meaningless without a manual propped next to the console screen. In a few cases, they're actually misleading. For instance, neglecting to terminate a program with an end statement causes ASMZ80 to issue an "F" error, meaning an invalid comment field.

Abridged error messages could be overlooked if the assembler delivered superior performance, but the benchmark timings are nothing to write home about. Furthermore, ASMZ80 complicates, rather than simplifies, the process of creating a .COM file. The assembler produces an Intel object file. That file must then be fed into a RELMS utility program that converts it into Intel hex format. Finally, the CP/M Load utility converts the hex format into a .COM file.

Other liabilities include a six-character label restriction, a 30-macro limit and the lack of a keyboard abort. Six-character label limitations have no place in a programming tool of the 1980s. Symbols become so abbreviated, you might as well use the hex address.

Listing continued.

```

85 21CB DD 19          ADD    IX,DE
86 21CD DD 36 00 00    LD     (IX+0),0
87
88 21D1 ED 5B 0170     LD     DE,(PRIME)      ; point to next multiple
89 21D5 2A 016E        LD     HL,(PINDX)
90 21D8 19             ADD    HL,DE
91 21D9 18 DD          JR     ZAPMULT
92
93 21DB DD 2A 016C     INCCOUN LD    IX,(COUNT)      ; increment primes found
94 21DF DD 23          INC     IX
95 21E1 DD 22 016C     LD     (COUNT),IX
96 21E5 60             LD     H,B      ; HL <- FLAGS index
97 21E6 69             LD     L,C
98 21E7 B7             OR     A      ; clear carry
99 21E8 18 B1          JR     NXTELEM ; check next element
100
101 ; Iteration done.
102 21EA 3A 016B        ITRDON LD    A,(ITER)      ; last iteration?
103 21ED FE 09          CP     9
104 21EF 28 0D          JR     Z,ALLDONE      ; yes
105 21F1 3C             INC     A      ; no--increment iterations
106 21F2 32 016B        LD     (ITER),A
107 21F5 21 0000        LD     HL,0      ; reset count
108 21F8 22 016C        LD     (COUNT),HL
109 21FB C3 2180        JP     NXTITER
110
111 ; Done--convert result to ASCII via brute force.
112 21FE 2A 016C        ALLDONE LD    HL,(COUNT) ; convert COUNT to 4-digit
113 2201 DD 21 011A     LD     IX,PRIMES ; ASCII decimal
114 2205 DD 36 00 2F    LD     (IX+0),'0'-1 ; initialize ASCII digit
115 2209 01 03E8        LD     BC,1000 ; convert thousands
116 220C DD 34 00       CLOOP1 INC    (IX+0) ; simulate divide by 1000
117 220F B7            OR     A      ; clear carry
118 2210 ED 42          SBC     HL,BC ; less than 1000?
119 2212 30 F8          JR     NC,CLOOP1 ; no--keep going
120 2214 09             ADD    HL,BC ; oops, too much
121
122 2215 DD 23          INC     IX      ; point to second digit
123 2217 DD 36 00 2F    LD     (IX+0),'0'-1 ; initialize it
124 221B 01 0064        LD     BC,100 ; simulate divide by 100
125 221E DD 34 00       CLOOP2 INC    (IX+0)
126 2221 B7            OR     A      ; clear carry
127 2222 ED 42          SBC     HL,BC ; less than 100?
128 2224 30 F8          JR     NC,CLOOP2 ; no--keep going
129 2226 09             ADD    HL,BC ; oops, too much
130
131 2227 DD 23          INC     IX      ; point to third digit
132 2229 DD 36 00 2F    LD     (IX+0),'0'-1 ; initialize it
133 222D 7D             LD     A,L ; simulate divide by 10
134 222E DD 34 00       CLOOP3 INC    (IX+0)
135 2231 D6 0A          SUB     10 ; less than 10?
136 2233 30 F9          JR     NC,CLOOP3 ; no--keep going
137 2235 C6 3A          ADD    A,'0'+10 ; oops, too much
138
139 2237 DD 23          INC     IX      ; point to fourth digit
140 2239 DD 77 00       LD     (IX+0),A ; save least sig. digit
141
142 223C 11 0117        LD     DE,ENDMSG ; DE -> message
143 223F 0E 09          LD     C,PSTRING ; display results
144 2241 CD 0005        CALL    BDOS
145
146 2244 ED 7B 0169     LD     SP,(SAVESP) ; restore system stack pntr
147 2248 C9             RET ; return to CP/M
148

```

0 Error(s) Detected.

8521 Absolute Bytes. 27 Symbols Detected.

Cross Reference

21FE ALLDONE	104	112					
0005 BDOS	7	40	144				
0103 BGNMSG	14	38					
218D CHKELEM	50	67					
220C CLOOP1	116	119					
221E CLOOP2	125	128					
222E CLOOP3	134	136					
016C COUNT	25	93	95	108	112		
000D CR	5	14	15	16	19		
0117 ENDMSG	16	142					
1FFF FLAGLEN	32	45	58	80			
0172 FLAGS	28	32	42	44	50	83	
21AC FNDPRIM	56	70					
21DB INCCOUN	82	93					
016B ITER	24	102	106				
21EA ITRDON	60	102					
000A LF	6	14	14	15	15	16	19
219B NXTELEM	58	99					
2180 NXTITER	42	109					
016E PINDX	26	78	84	89			
0170 PRIME	27	74	88				
011A PRIMES	17	113					
0009 PSTRING	10	39	143				

Symbol Table

0169	SAVE\$P	22	36	146
0169	STACK	21	37	
2171	START	12	36	
2188	ZAPMUL	78	91	
21FE	ALLDNE	0005	BDOS	0103
218D	CHKELE	220C	CLOOP1	221E
222E	CLOOP3	016C	COUNT	000D
0117	ENDMSG	1FFF	FLAGLEN	0172
21AC	FNDPRIM	21DB	INCCOUN	016B
21EA	ITERDON	000A	LF	219B
2180	NXTITER	016E	PINDX	0170
011A	PRIMES	0009	PSTRING	0169
0169	STACK	2171	START	2188
				ZAPMUL

Constraining macros to a maximum of 30 definitions seems to be another arbitrary limitation. Certainly, you won't be able to rely on ASMZ80 with only 30 macros for those situations where you want to define an alternate instruction set with macros in order to cross-assemble code for a non-Z80 processor.

And lack of a keyboard abort—what can I say about that cardinal sin? Would you buy a oven if you couldn't shut it off until it cooked for the designated time? Or a car that didn't stop until it reached its destination even if you forgot to bring your wallet? I'm sorry, but programs that won't spend a piddling few milliseconds to occasionally check the keyboard should be banned by federal edict.

Given its flaws, I can't recommend RELMS's Z80 assembler for serious software development. Still, it has some redeeming points that should be mentioned for the record.

Redeeming Points

Twenty operators are available for constructing expressions of virtually any conceivable form. ASMZ80 offers the garden variety (four function) arithmetic and logical (Not, And, Or) operators. RELMS then supplements these with the modulo or remainder function and, of all things, exponentiation. It's the first time I've come across an assembler, or any compiler for that matter, that supports exponentiation in constant expressions.

The company supports the product with a toll-free 800 hot line connected to its Silicon Valley office. It also offers a free, one-year update for new releases of the software.

Besides the ASMZ80 assembler, RELMS's catalog is chockful of hardware and software products for the software development environment. The stable includes Ice-boxes (in-circuit emulators) with more than 256KB of ROM and RAM, communications programs and CP/M-based cross-assemblers, which generate code for 17 different microprocessors.

I suspect that the diversity of the assembler product line accounts for some of the flaws found in ASMZ80. The same core program is probably used in all of the assemblers. Modules or tables are then replaced to generate, say, a 6800 instead of a Z80 assembler. While a universal assembler that conveniently generates code for a variety of machines is a commendable endeavor, it inevitably sacrifices the optimal performance achieved by the fine-tuned single-system assemblers.

You could live with the shortcomings of the RELMS assembler, if it weren't for the price. But after grappling with the problems and realizing that you paid close to four hundred dollars for the opportunity, you're left with only one conclusion: where's the beef?

MOPI: A Different Cut

Inevitably, the first question that arises when shaking down the MOPI assembler is: what does the

name stand for? MOPI is an acronym for Macro Oriented Program Interpreter. Just as intriguing as its name is its history. According to the vendor, Voice Operated Computer Systems (VOCS) of Minneapolis, MOPI is designed as "the first step towards development of a completely voice-operated computer system."

While officials at VOCS admit that voice-operated computers won't universally replace keyboards within the next two weeks, they will have completed that first step, MOPI. The company touts the product as a regular assembler, cross-assembler, special purpose compiler and software simulator, in that order. Of these functions, MOPI may fit the bill for the latter three but posts a poor showing as a regular assembler.

Functionally, MOPI resembles a conventional cross-assembler. The interpreter part of the name shouldn't be construed to mean an interpretive language like Basic or APL.

Two tables define the instruction set of the system: an assembly language instruction table (ALIT) and macro instruction table (MIT). The ALIT contains instruction mnemonics and operation codes of the target machine. According to the documentation, you should be able to generate machine code for any eight-bit microprocessor with different ALIT's.

Another style nuance is the program's failure to recognize tab characters, namely, Control-I (hexadecimal 09). If you thought the tab character was supported by all CP/M editors, compilers and assemblers, chalk up an exception. Embedding a tab in a source file headed for MOPI subsequently produces a sure-bet syntax error.

When the program issues syntax errors and other diagnostic messages, keep pencil and paper handy, because MOPI won't create a listing file until the source code is error-free. You can't inspect a listing to study the assembler's di-

agnostic messages; students in Programming 101 will have fun with that one.

Not What You Expect

Once you finally create a listing file on disk, with error-free source code, it's not quite what you'd expect. The sagacious MOPI employs data compression producing a non-ASCII file, which means that the Type command and other CP/M standard utilities can't display or print a word of it in intelligible form. How do you get a printout? you might ask. You crank up a MOPI utility that takes the listing file and converts it to ASCII while sending it to the printer.

The same utility generates a cross-reference, again sending it directly to the printer. This methodology explains why the comparison chart lacks a time for MOPI's listing/cross-reference to disk benchmark. The time given for the listing-only benchmark pertains to MOPI's compressed listing format.

The utility program exhibits narrowness-of-scope design flaws prevalent in other parts of the system. Responses to program prompts must be in uppercase only—lowercase results in *no comprende*. When the time comes to enter a filename, do it carefully. An invalid entry catapults you back to the operating system, where you have to reload the program and try again.

Once the utility program does get going, forget about trying to abort through Control-C, escape or any other keyboard sequence that may seem reasonable. The utility program, like the assembler, works blindly, oblivious to creatures called users.

The liability list continues, but there's no point in belaboring it. MOPI incorporates arbitrary approaches, detracting from its flexibility, usefulness and overall attractiveness to the typical assembler programmer.

I preface that last phrase with the word "typical" because those

who need a cross-assembler or an assembler for an alien instruction set may find enough redeemable merit in MOPI to outweigh the shortcomings. The table-driven operation does offer universality, a point underscored by the 8080, Z80 and 6502 assembler tables delivered with the stock system.

To the programmer concerned solely with the 8080 or Z80 envi-

ronment, though, the power to assemble code for a 6502 adds up to nothing. If you fall into that class, you'll want to pursue products closer to the mainstream of what assemblers do. The MOPI alternative offers no advantage. □

Address correspondence to Edward Joyce, Route 9, Box 149, Charlottesville, VA 22901.

The Heart of the Chart

Many of the chart categories are self-explanatory. Others warrant explanation. I chose an assembler version of the gold standard of benchmarks, the Sieve of Eratosthenes prime number generator, to peg performance. This program, shown in Listing 1, performs ten iterations of calculating the 1899 prime numbers between three and 16,381.

I executed three variations of the benchmark: assembling the Sieve program without a listing; assembling with a listing created on disk; and assembling with a listing and cross-reference created on disk.

The tests were conducted on a Xerox 820 system with two single-sided, single-density eight-inch disks and 64KB of RAM. The Xerox 820 runs its Z80 microprocessor at 2.5 MHz. The Sieve program, incidentally, executes in 17 seconds on the Xerox. Compare this to 35 seconds for Pascal MT/ +

and 2380 seconds for Microsoft Basic on the same machine, and you begin to understand why assembler is still the language of choice among programmers who handcraft code for ultimate speed.

After performance, the comparison chart indicates the presence or absence of noteworthy characteristics. The "Generate .COM or .HEX file" category refers to the output of assembler. Some programs produce an executable .COM file. Others produce hexadecimal format with a file extension of .HEX that must be converted to a .COM file by the CP/M Load utility program. Still others produce either type of file. For the CP/M environment, producing a .COM file is more convenient and much preferred.

The mnemonic type classifies the instruction set used by the assembler in the standard configuration. The original Digital Research ASM assembler supplied with CP/M

uses Intel mnemonics. Most Z80 assemblers tend to rely on Zilog mnemonics. The difference between the two is just enough to perpetually stymie the novice and occasionally trick the veteran.

Software shops that already have a significant program investment in a particular style of mnemonics should be especially concerned with this category. The benefits of a new assembler may be wiped out by the hassle of dealing with an alien set of mnemonics.

Abort capability on the comparison chart simply indicates whether or not you can terminate or interrupt an assembly from the keyboard. Surprisingly, many programs plod along in their own little world, oblivious to all but the reset button or power switch.

The final two categories, diagnostic error messages and overall rating, were labeled good, fair or poor. The quality of diagnostic messages can make or break an assembler. On one extreme, some programs indicate a syntax error with an arbitrary number or single-character code, which needs to be deciphered in a manual. Other programs provide a textual description, which pinpoints the problem much quicker. The error messages were monitored while the assembler tangled with a source code file containing a dozen errors of various types.

Overall rating relates to the general feel of the product. It conveys the flavor of the meal after you know the ingredients, calories and cooking time. This category not only compares the product with the other assemblers, but it also pits the program against popular commercial software.

Unfortunately, none of the overall ratings warrant an excellent designation. Microcomputer assemblers, the most essential tools for software development, still fall dismally short of the high standards established for user friendliness and functionality now commonplace in the applications software arena.

E.J.

Name	Z80ASM, version 1.05	ASMZ80, version 3.6C	MOPI, version 2.0
Manufacturer			
	SLR Systems 1622 N. Main St. Butler, PA 16001	Relational Memory Systems 1650-B Berryessa Rd. San Jose, CA 95133	Voice Operated Computer Systems PO Box 3705 Minneapolis, MN 55403
Price	\$199.95	\$395	\$175
Time to produce .COM file			
Sieve with no listing	23 seconds	62 seconds	55 seconds
Sieve with listing	35 seconds	73 seconds	85 seconds
Sieve with listing and cross-reference	35 seconds	87 seconds	*
SUBMIT (batch mode) compatible	Yes	Yes	Yes
Generate .COM or .HEX file	Either	**	Either
Mnemonic Type	Zilog	Zilog	Hybrid
Abort Capability	Yes	No	No
Interactive Mode	Yes	No	No
Significant Characters in Labels	16	6	6
Macros	Yes	Yes	Yes
Conditional Assembly	Yes	Yes	Yes
Linker	Yes	Yes	No
Relocatable Code	Yes	Yes	Yes
Diagnostic Error Messages	Good	Poor	Fair
Overall Rating	Good	Poor	Fair

*MOPI generates a cross-reference directly on the printer instead of in a disk file.

**ASMZ80 produces intermediate code that is converted by a utility program into a .HEX file.

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All Career courses approved under GI bill.

☐ Check for details.

Name (Please Print) _____

Age _____

Street _____

() _____

City/State/Zip _____

Phone _____

172-114

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TRS-80 is a trademark of the Radio Shack division of Tandy Corp.

Connect Time

By Chris Crocker

Combating Shopping Mall Phobia

Buying On-line at the Comp-U-Store

About this time of year I start to get nervous—the holidays are approaching and I haven't a clue about what presents I'm buying for anyone. So I make up a wishful little list, connecting names with gift ideas and price ranges. I promise myself that I'll go shopping and hope that I come back with my list all checked off and packages loaded in the trunk of my car.

Inevitably, I never make it; I have shopping mall phobia. I tremble at the thought! No sooner do I enter the doors of some glamorous bazaar than my eyes glaze over, my throat gets dry, my legs ache and my mind numbs. I've been known to wander around stores, staring blankly at products and telling store clerks that I don't need help. And I always walk out without a single purchase—or, if I'm really determined, something like an unbreakable comb. You can never have too many.

Catalog shopping has made a world of difference in my holiday shopping practices. If I plan early enough, I can go through the catalogs and pick out the presents I want. I usually do pretty well, and

I don't have to wander through the ladies' departments sheepishly fumbling through the dress racks in search of a present for my wife. With a catalog, I retain that pleasant sense of anonymity, selecting at leisure what I want to buy. The major difficulties I run into have to do with higher prices, not being able to see the entire product and shipping delays.

The on-line utilities have a number of catalog shopping services cropping up, and I thought I'd check into them this month to see if they can be as useful to people like me as printed catalogs are.

The Major Contenders

In terms of sheer volume and variety of products, the biggest on-line shopping system is Comp-U-Store, and it's available through both CompuServe and The Source for an added fee. For \$25 a year, you can order on-line from a selection of more than 60,000 products, ranging from razors to VCRs, and charge directly to your credit card.

To show you how Comp-U-Store works, I'll go on a little shopping trip. Let's say I'm looking for a range hood—the perfect gift for a loved one on any special occasion. Here's how I could go about ordering it.

After I select the Comp-U-Store option from the main service, I'm greeted with a few introductory messages and the following menu:

Comp-U-Store Shopping Service

- 1 Overview/Instructions
- 2 Comp-U-Store Browsing
- 3 Comp-U-Store Membership
- 4 Comp-U-Store Ordering and Bidding

Enter item number or HELP

If I want to browse, I select item 2 from the menu, and the Comp-U-Store main menu appears. I'm ready to start shopping, so I instead select item 4, provide my Comp-U-Store membership number and access code. After my codes clear, the main menu appears.

Main Menu

1. Help Information
2. Member Sign-up/Address Change
3. Comp-U-Gram Questions/Answers
4. Scavenger Hunt
5. Comp-U-Stakes Auction

Shopping Ordering

6. The Comp-U-Store
 7. Best Buys (Databasement)
 8. The Home Furnishing Store
 9. The Comp-U-Mall
- Enter an item #:

I don't want to fool around, so I go right to the Comp-U-Store by selecting option 6. Next, I'm prompted to enter the product type or type LIS for a listing of product types. I don't know the code for range hood, so I type LIS for a list of product categories and codes.

#	Categories
1	Appliances
2	Cameras, optical equipment
3	Cars, car stereo, tires
4	Tableware
5	Luggage
6	Sporting goods
7	Stereo, audio equipment
8	TV, video equipment
9	Other electronics
10	Computers, accessories
11	Miscellaneous

Enter 'A Category # :

Range hoods are appliances (I guess), so I select option 1 and see this list of products:

Code	Product
ACND	Air conditioners
APAC	Appliance accessories
CKTP	Cooktops
COPC	Compactors
CTAP	Countertop appliances
DHMD	Dehumidifiers
DRYR	Dryers
DSHW	Dishwashers
DSPS	Disposers
FRZR	Freezers
HSAP	Household appliances
MCRW	Microwaves
RANG	Ranges
REFR	Refrigerators
RNHD	Range hoods
VCUM	Vacuum cleaners

Press Return/Enter to continue or enter selection:

The code for range hoods is RNHD, so I enter that code.

Enter:
Brand name
(NP) No preference
(LIST) Brand listing

Not knowing who makes these things, I select LIS again for a listing of range hood manufacturers.

Code	Manufacturer
AMNA	AMANA
CLRC	CALORIC
GE	GENERAL ELECTRIC
HTPT	HOTPOINT
LITT	LITTON
MAID	MODERN MAID
MGCF	MAGIC CHEF
OKME	O'KEEFE MERRITT
RPER	ROPER
SHRP	SHARP
TAPN	TAPPAN
WRPL	WHIRLPOOL

Press Return/Enter to continue or enter selection:

After seeing this list, I realize that I don't care who makes my range hood, and I just press [return].

Enter:
Brand name
(NP) No preference
(LIST) Brand listing
>

I type NP to indicate that I have no preference.

Size in inches?
(NP) No preference
(1) 30 inches
(2) 36 inches
(3) 42 inches
(4) 48 inches
(5) Other
(6) Blower
>

I select option 1.

Duct?
(NP) No preference
(1) Ducted
(2) Ductless
>

I guess I want ducted, so I enter 1.

Ship-to State
(necessary for quote)
>

I want it shipped to New Hampshire, so I type NH. The system verifies my response by spelling it out and asking me to confirm it. Next appears the all-important question:

What's the most you will spend?
> \$

I once heard that range hoods cost about \$50, so that's what I entered, only to be greeted with the following:

% AQS322 - None in price range
New price range? (Y or N):

All right, so I'm cheap. But I'm a game sport. I'll raise the stakes, and type Y to set a new price range.

What's the most you will spend?
> \$

I'll go for it all, entering \$100.

Range hoods			Page 1 of 2
#	Mfg	Model	FDC
1	CLRC	HWR302	63.60
2	GE	JV322	67.41
3	GE	JV324	72.66
4	GE	JV332	70.56
5	GE	JV334	75.80
6	HTPT	JV322	70.05
7	HTPT	JV324	73.36
8	HTPT	JV332	72.26
9	HTPT	JV334	76.68
10	MGCF	HC30AB2	93.67

Enter: An item #, or
(p#) for that page
(CHA) to change >

Because price is really my only concern now, I select option 1 and get a description of the Caloric HWR302 range hood:

Range hoods
Brand: CALORIC Model: HWR302
List: open
Price: 45.60
With shipping and handling: 63.60 Color: WH AV AL CP GD
Description:
30" VENTED HOOD. FEATURES 2-SPEED FAN LIGHT. CAN BE DUCTED HORIZONTALLY OR VERTICALLY.
Want to order (Y or N)?

To order the item, all I have to do is answer with Y and supply the necessary color information. I can now store my order while I continue shopping, cancel my order or process it.

I went through this rather lengthy description for several reasons. First, I wanted to give you an idea of just how much goes into a system like this. Just think: for every product category, a set of customized questions is specially designed for that particular category to help define the choices. It's pretty impressive. Second, I

thought that it would show you how the system works. Finally, I wanted to buy a range hood, but I didn't.

Why didn't I buy it? Well, the shipping and handling cost of this range hood was more than 20 percent of the overall cost of the item, and I thought that was too much. I checked around locally, and I found one cheaper at Charlie's Home Center here in Peterborough. And if something goes wrong with it, I can gripe to Charlie face to face. But that doesn't mean that there aren't any bargains on Comp-U-Store. Let's look at Comp-U-Store's Databasement for a minute.

Comp-U-Store's Databasement

Ever give someone a gift that you really wanted for yourself? Like the year you bought your dad the Jesus Christ Superstar album—with his money—because he liked opera? Well, that was the mood I was in when I first tried out Comp-U-Store. I was looking for a birthday present for my wife, and I had no idea what I wanted to get her. I saw the Databasement, and I knew there must be some bargains there that I just couldn't pass up.

The Databasement works much like most of Comp-U-Store, except that it only includes selected "bargains." Most of these are priced at substantial savings, so it's worth a peek. Here's a list of some of the deals recently available on microwave ovens, using the browse feature of Comp-U-Store. The shipping and handling cost is calculated on shipment to New Hampshire:

MICROWAVES

Brand: PANASONIC Model: NE6650
List: 339.95
Price: 193.31
With shipping and handling: 193.31
SAVE: 146.64

Description

COUNTERTOP MODEL WITH ROTARY CONTROLS. COOKS BY TIME POWER LEVELS. FEATURES 30-MINUTE TIMER, DEFROST FOOD CAROUSEL. 9 CU. FT. CAPACITY. 13-3/8"H x 20-7/8"W x 16-3/4"D.

MICROWAVES

Brand: LITTON Model: 1440
List: open
Price: 219.91
With shipping and handling: 235.91

Description

PROGRAMMABLE COUNTERTOP MODEL WITH ELECTRONIC TOUCH CONTROLS. COOKS BY TIME, TEMP, OR POWER LEVELS. 0.8 CU. FT. CAPACITY.

MICROWAVES

Brand: AMANA Model: RRL8TD
List: open
Price: 290.91
With shipping and handling: 340.91 Color: BR

Description

COUNTERTOP MICROWAVE W/SINGLE MEMORY PROGRAM AND ELECTRONIC TOUCH CONTROLS. COOKS BY TIME, TEMP, OR VARIABLE POWER LEVELS. HAS TEMP. HOLD DEFROST. 1.0 CU. FT. 15-1/2"H x 22-3/4"W x 18"D.

MICROWAVES

Brand: LITTON Model: 1460
List: open
Price: 245.90
With shipping and handling: 261.90 Color: WG

Description

PROGRAMMABLE COUNTERTOP MODEL W/ELECTRONIC TOUCH CONTROL. COOKS BY TIME, TEMP. VARIABLE POWER LEVELS. HAS DEFROST CYCLE, DELAY START DIGITAL CLOCK. .8 CU. FT. 12-1/2"H x 20-1/2"W x 14-1/2"D.

MICROWAVES

Brand: SHARP Model: R4840
List: 449.95
Price: 278.02
With shipping and handling: 328.02
SAVE: 171.93

Description

PROGRAMMABLE COUNTERTOP MODEL WITH TOUCH CONTROLS. COOKS BY TIME, TEMP. POWER LEVELS. HAS DIGITAL CLOCK, TIMER, FOOD SENSOR, FOOD CAROUSEL, DEFROST. 1.0 CU. FT. 14-3/4"H x 22"W x 15-3/8"D.

Some of these prices are quite impressive. If I purchased one of these microwave ovens, the savings would more than pay for a few years' membership fees on Comp-U-Store. Still, I'd like to drop by a nearby department store to check

out some working models and compare prices. Then, if the savings on Comp-U-Store were still considerable, I'd go ahead and order the model I want on-line.

In addition to the standard ordering and the bargain basement, Comp-U-Store also lets you order from a number of independent companies through the Comp-U-Mall. Another option lets you order home furnishings. You provide the specifics, including a maximum price you want to spend, and the company calls you back when it finds what you're looking for.

The Electronic Mall

The next service of note is CompuServe's Electronic Mall. The Electronic Mall (GO SHOP) is set up the way it sounds—like a shopping mall. You move in and out of "stores" and review or order products. When you find something you like, you indicate with an O that you want to order it. Then, before you leave the store, you provide the necessary payment and shipping information.

Because the individual stores are set up independently, there's little consistency among the vendors in the way they present the material or how they move you through the stores. However, they're all menu-driven, so it's not that difficult to catch on. Here's an example of a visit to Waldenbooks, one of the vendors in the Electronic Mall:

Waldenbooks Page WB-1

WELCOME TO WALDENBOOKS

1. Introduction
 2. The Waldenbooks Catalog
 3. Customer Service
 4. Waldenbooks Store Locations
 5. Ordering Information
- Last menu page. Key digit or M for previous menu.
!

To get right into the Waldenbooks catalog, I select option 2.

Waldenbooks Page WB-10

Waldenbooks Catalog

1. The Computer Connection
2. Business Personal Finance

3. Video Cassettes
 4. Audio Cassettes
 5. Waldentapes (tm)
 6. Fiction
 7. Non-Fiction
 8. Science Fiction and Fantasy
 9. Just for Kids.
 10. Health and Fitness
- Input a number or key
<ENTER> for more choices
!

I press [return] for the rest of the list.

Waldenbooks Page WB-31
Waldenbooks Catalog (continued)

11. Sports
12. Self-Help and Inspirational
13. Cooking
14. Travel
15. How To
16. Reference
17. Special Values

Last menu page. Key digit
or M for previous menu.
!

For this demonstration, I'll select
How To by entering 15.

13 articles selected

Waldenbooks Page WB

- 1 ALL ABOUT LANDSCAPING
- 2 HOW TO DESIGN AND BUILD DECKS
AND PATIOS
- 3 HOW TO GROW HEALTHY HOUSE
PLANTS
- 4 HOW TO PHOTOGRAPH WOMEN
- 5 HOW TO PLAN AND BUILD DECKS
- 6 HOW TO PLAY GUITAR
- 7 HOW TO PLAY PIANO
- 8 HOW TO TURN AN INTERVIEW INTO
A JOB
- 9 HOW TO WRITE BETTER RESUMES
- 10 KODAK POCKET GUIDE 35MM
PHOTOGRAPHY
- 11 LEARN TO READ MUSIC
- 12 SUNSET INTRODUCTION TO BASIC
GARDENING
- 13 WOMEN'S DRESS FOR SUCCESS

Last menu page. Key digit
or M for previous menu.
!

To see what the landscaping book
is like, I enter 1.

Waldenbooks Page WB-490

ALL ABOUT LANDSCAPING
An Ortho Book

Here are the techniques, tools and insights
you need to make your landscaping create
any feeling or style you want. Dozens of

color illustrations and drawings explain de-
sign, installation and up-keep for the do-it-
yourselfer.

Enter "O" to order.

ITEM NO.: 7523 PRICE: \$5.95

Last page. Key M for menu

It seems like an interesting book,
so I'll type O to order it. After I
press O, nothing seems to happen.
But what has happened is that I've
marked that book as one I'd like to
purchase when I leave the store. If
I want to order another book, I
can step through other selections,
and select ones I want to buy by
using the O command again. It's
just like filling a shopping cart; I
don't pay until I'm ready to leave
the store. When I do decide to
leave, I supply the appropriate bill-
ing and shipping information, and
my order is processed. I get a con-
firmation by e-mail, and my ship-
ment is forthcoming.

Waldenbooks is just one of many
stores in the Electronic Mall. There
are at least 75 vendors, ranging
from Big T Automotive to Stark
Brothers Nursery, as well as major
department stores like Sears and
Bloomingdale's, banking services,
book dealers and travel services.
Some of the vendors in the mall
don't allow purchasing on-line, and
some only let you request a catalog.

One Point Electronic Catalog

The One Point Electronic Catalog
is billed as providing information
and evaluations on thousands of
pieces of IBM PC and business ap-
plications software. The system
also provides for on-line ordering
of software and other computer
products.

The two major functions on One
Point are searching and browsing.
Browsing, on one hand, is the pro-
cess of narrowing a search from
types of products (applications soft-
ware) to specific product categories
(word processing) to a list of spe-
cific products to expanded infor-
mation on each selected product.

Searching, on the other hand, is
like walking into a store when you
know what specific products you're
interested in, but you want more
information or you want to order
the specific product.

The One Point User's Guide lists
a huge number of product cate-
gories, from disks to Ada to Span-
ish word processors. Unfortunately,
you don't find products in the elec-
tronic catalog in every category
listed in the manual. For example,
at the time I called, there were no
entries in the computer paper cate-
gory; the disks listed didn't include
prices, and no software was listed
in some disk formats. However,
quite a few software packages were
listed under most applications,
even six or seven items in the bul-
letin board software category.

I don't know how many times
I've been asked if I can locate a
software package that has certain
capabilities. This is where One
Point might be particularly useful—
it serves as a great product locator.
When someone wants to find infor-
mation about investment packages,
for example, I can call up a sizable
list and get some price quotes on
them as well. The prices are usu-
ally below list, although just how
far below they are varies.

Charges for One Point are per
10,000 characters received. Cur-
rently, One Point costs \$1 per
10,000 characters, but the access
number is in California, a mone-
tary consideration for Easterners.

Another on-line software search
and ordering system is Menu, the
International Software Database,
which is available on Dialog. This
database lists more than 50,000
software products for micros, minis
and mainframes, and allows you to
conduct searches and place orders.
The product listings include de-
scriptions and prices, and the
searches may be printed out and
mailed to you or delivered on-line.
This database is large and rela-
tively complex, but if you're look-
ing for an obscure vertically
oriented package, you can probably

find and order it here. Connect time costs \$60 per hour.

Other On-line Shopping Opportunities

CompuServe, The Source and Delphi all offer other merchandise and services to subscribers. CompuServe offers the Fifth Avenue Shopper in the Home Services section, letting you order Godiva Chocolates, send flowers through the wire services, and buy books, perfume and computer software, equipment and supplies. The Source also lets you order books and records on-line.

In addition to the larger utilities, many public bulletin boards sell merchandise. You can order anything ranging from marital aids to modems on-line, depending on the system you've called.

You might watch out for shipment and return policies on the systems you're considering. I noticed a few shipped F.O.B., meaning prices didn't include shipping, and you had to check around to determine how much shipping will cost. Also, check the return policy. You haven't seen the product yet, and some services—especially the bargain and salvage types—allow returns only on those products that don't meet up to the product description. So if the description says blue, and you get your order and don't like the shade, you're stuck.

One caveat for those buying from the less established systems: recent events involving a few allegedly corrupt bulletin boards have raised some concern about being too free with credit card numbers. I regret that it's come to this, but you might want to check out a bulletin board carefully before you order. It's unfortunate that a bit of news like that can hinder such a potentially phenomenal sales device as the bulletin board, but I guess that's life.

The Bottom Line

The big question is whether on-line shopping is a worthwhile en-

deavor. All in all, I'm pleased with what I can buy on-line. I can save money, I can avoid those miserable shopping excursions and I can enjoy buying gifts this way.

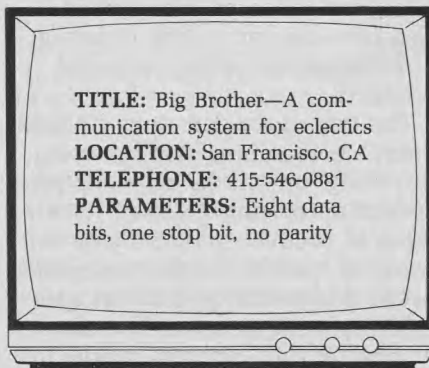
The biggest drawback is that I can't see what I'm buying. It's kind of fun to make a blind purchase, but it can be annoying.

A second drawback has to do with price. Just because a service lets you shop on-line, it doesn't mean that it's going to save you money. Many on-line shopping systems are provided as a convenience, not as a bargain basement. Besides, if you pay for connect time or for characters received and telephone charges, every shopping expedition costs you money.

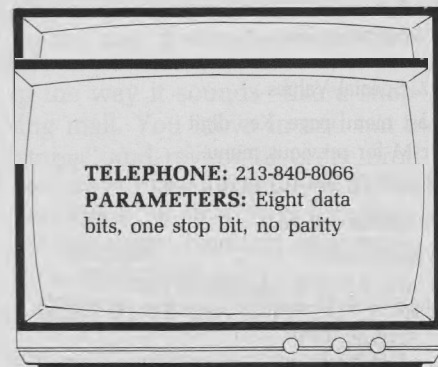
The best time to use an on-line shopping service is when you know pretty much what you want, what it costs and how hard it is to obtain. You can then compare prices or look for something you can't find in stores. You've already made your decision in terms of evaluating the options, and you can place your order rapidly. Then you might save some time or money by purchasing through an on-line service. □

BULLETIN BOARDS VISITED

To wrap up "Connect Time," I'll leave you with a few bulletin boards that offer merchandise on-line—to give you some unusual shopping ideas for the holidays.



This system is sponsored by Ralph Records, a bizarre publisher of somewhat off-the-wall recording artists, including the Enid, the Residents and Snakefinger. The directory includes such selections as Gossip, Charts, Reviews, Summon a Ralph Human (chat) and Feed Frank (feedback). Be ready for the unexpected here. If you select Charts, for example, you'll get a message like "I bet you thought this was charts. Nobody reads charts, so here is something different . . ." You can order a record catalog through this system that is almost as strange as the bulletin board itself.



The system is an on-line shopping mall with an interesting setup. It's designed to make you feel like you're in a multilevel shopping center. Announcements come over the public address system, you meet store clerks and you even ride an elevator. You move along corridors within the mall and turn left or right to enter the stores. Products for sale include telephones, bulletin board software and on-line service starter kits. Fantasy Plaza is produced by the people who bring you Dial-Your-Match. Some of the products are interesting and inexpensive, but there's not a tremendous variety.

Address correspondence to Chris Crocker, PO Box 702, Peterborough, NH 03458, or contact him on CompuServe: 70116,752; The Source: BBW440; or Delphi: MICROCOMP.

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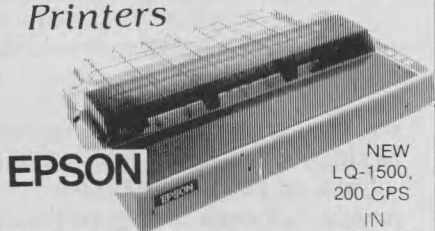
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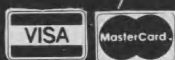
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The Unix Pipeline

By Phil Hughes

Unix Editors: Meet *ed* and *vi*

Line by Line Operation and Window Shopping

Unix editors, specifically *ed* and *vi*, are the subjects I'll address in this column. In October, I explained regular expressions and explored the use of the program *grep*. Both *ed* and *vi* use regular expressions, so anything you remember from last month's column should help you.

In computing's early days, editing meant that you went back to the keypunch, repunched the errant card and inserted it into the deck. Fancy capabilities meant the keypunch allowed you to duplicate a card correcting any columns in error. The first interactive editor that I worked with actually had fewer capabilities than the old keypunch. It was associated with a timesharing system that supported only interactive Basic. The sole editing capability was the ability to retype a line preceded by a line number. The editor automatically inserted it into the correct place in the file.

Appearance of *ed*

This experience was in 1970, about the same time Unix and *ed* appeared on the scene. The aver-

Before you rush off, let me tell you the virtues of *ed*. It's frugal and has powerful commands.

age terminal then was a model 33 Teletype. If you're unfamiliar with this beast, it offers a mechanical keyboard, makes a lot of noise and prints at ten characters per second. *Ed* was designed with this type of terminal in mind.

Not a Screen Editor

Ed is a line editor. Rather than working with a window into a file like a screen editor, it operates on one line at a time. Before you rush off, let me tell you the virtues of *ed*. First, it's frugal. It uses much less memory space and CPU time than a screen editor. This means little to the user of a dedicated computer, but, if you're sharing a heavily loaded computer system,

you may get more work done with *ed* than with a fancy screen editor.

Next, *ed* has powerful commands. Although it only works on one line at a time, you can direct it to apply a command to any set of lines or to all the lines in a file. Many screen editors don't allow this. Finally, because it doesn't display a screenful of information every time you make a change, it can be used on slow terminals or on terminals connected to the system over a slow modem.

Because *ed* was designed to work with slow terminals, its error messages are short. Let's get the error messages out of the way before I talk about the commands. The most common error message consists of a single question mark (?). This means you tried to do something that *ed* didn't understand. I'm serious, that's all you get. The second (other) error message is TMP?

Ed uses a work buffer to save file changes rather than making changes directly in your file. This message means that you've caused *ed*'s work buffer to overflow and lose something. Before you ask—sorry, it's not recoverable.

Power Packed

If you're still with me, I'll show you that *ed* really is a powerful editor. Commands consist of a single letter. In many commands, the verb can be preceded by an address. This address identifies the line or lines on which the command is to operate. Addresses can consist of a combination of specific line identifiers, tagged lines and regular expressions to search for. All commands offer default values for the address.

Armed with this introduction, take a look at Table 1. The second section in the table lists the commands in alphabetical order. In this section, the values in parentheses indicate the default line range that the command acts upon. For example, `... + 1` in the line `(... + 1)j` indicates the default line range that the *j* command operates on. In this case, it's from the current line through the current line plus one. You can decipher this by looking up the meaning of `.` in the section on addresses. It says that a single period (`.`) is a reference to the current line. The second address `(. + 1)` is formed using the last address rule:

`[addr] ± [n]`

This will probably make more sense once you try a few commands. I also recommend you have access to a Unix system when you attempt to figure out *ed*.

Let's look at a simple editing session. First, you must execute *ed* by entering the command

ed

in response to a shell prompt. Here is another case where the verbosity of *ed* will amaze you. *Ed* says nothing. (As far as it's concerned, you haven't asked it to do anything yet. So why should it say anything?) After you sit and wait a long time, you'll probably type something just to see if the system is still alive. If you enter a valid *ed* command, it performs the requested task but probably says no more. If what you entered wasn't

Addresses

<code>.</code>	current line
<code>\$</code>	last line
<code>n</code>	nth line
<code>'x</code>	line marked as <i>x</i> with the <i>k</i> command
<code>/re/</code>	first line (forward) with <i>re</i>
<code>?re?</code>	first line (backward) with <i>re</i>
<code>[addr] ± [n]</code>	relative to specified address (<i>addr</i> defaults to <code>.</code> and <i>n</i> defaults to 1)

Commands

<code>(.)a</code>	append; end with period alone on a line
<code>(..)c</code>	change; end with period alone on a line
<code>(..)d</code>	delete
<code>e [file]</code>	edit <i>file</i>
<code>E [file]</code>	edit <i>file</i> ; no diagnostics
<code>f [file]</code>	set current filename
<code>(1,\$)g/re/cmds</code>	global on matching lines
<code>(1,\$)G/re/cmds</code>	interactive global
<code>h</code>	explain last ? diagnostic
<code>H</code>	toggle explanatory diagnostics mode
<code>(.)i</code>	insert; end with period alone on a line
<code>(... + 1)j</code>	join
<code>(.)kx</code>	set mark <i>x</i> at addressed line
<code>(..)l</code>	list displaying special characters
<code>(..)ma</code>	move lines after <i>a</i>
<code>(..)n</code>	print with line numbers
<code>(..)p</code>	print lines
<code>P</code>	toggle * prompt mode
<code>q</code>	quit
<code>Q</code>	quit without checking for buffer changes
<code>(\$)r[file]</code>	read <i>file</i>
<code>(..)s/re/nre/</code>	substitute
<code>(..)s/re/nre/g</code>	global substitute
<code>(..)ta</code>	copy lines after <i>a</i>
<code>u</code>	undo previous substitution
<code>(1,\$)v/re/cmds</code>	like <i>g</i> but unmatching lines
<code>(1,\$)V/re/cmds</code>	like <i>G</i> but unmatching lines
<code>(1,\$)w [file]</code>	write
<code>X</code>	encrypt during <i>r</i> , <i>e</i> or <i>x</i>
<code>(\$)=</code>	print line number
<code>!UNIXcmd</code>	execute Unix command
<code>(. + 1) < nl ></code>	print specified line

Note: If *file* (in *e*, *E*, *r* and *w* commands) begins with an *!*, it's a Unix command whose output is input to the edit buffer. In *w*, *!file* uses buffer as input to command.

Table 1. ED commands. Many commands are of the form address command. In these commands, the items in parentheses indicate default address values. Two values separated by a comma indicate an address range. *re* refers to a regular expression (see below). *nre* refers to a new (replacement) *re*.

Regular Expressions

<i>c</i>	the character <i>c</i>
<i>\c</i>	character <i>c</i> (for special characters)
<i>.</i>	any character except newline
<i>[str]</i>	any one character in <i>str</i>
<i>[^str]</i>	any character except <i>str</i> or newline
<i>re*</i>	0 or more occurrences of 1 character <i>re</i>
<i>re\{m,n\}</i>	<i>m</i> thru <i>n</i> occurrences of 1 character <i>re</i>
<i>\(re\)</i>	group <i>re</i> for later reference
<i>\n</i>	<i>n</i> th <i>re</i> in <i>\(...\)</i>
<i>^</i>	beginning of a line
<i>\$</i>	end of a line
string of <i>re</i> 's	concatenation of listed <i>re</i> 's
<i><null></i>	default <i>re</i> —last <i>re</i> encountered
<i>&</i>	put matched string in replacement
<i>%</i>	same as last replacement

Conventions:

- A % represents the system prompt.
- Boldface** represents items that must be typed as they appear.
- Italics* represent items that are to be substituted for.
- Brackets [] surround items that are optional.

valid, *ed* will print a single question mark.

On with the session. Entering the character *a* (followed by a carriage return) will cause *ed* to enter append mode. Until you enter a line that consists of a single period (*.*), everything you enter is appended to the buffer. Let's say I type the text shown in Table 2. I notice a whole bunch of errors (must have been typed by someone else). The first error I see is that I want to capitalize the word *I* in line 2. Entering the command

2p

instructs *ed* to set the current line to line 2 and display its contents. The *s* (substitute) command is the logical choice to make the change. The syntax is

s/re/nre/

where *re* stands for the current regular expression and *nre* is the new (replacement) expression. I entered

s/i/I/

p

to make the change and print out the line to make sure the change was what I wanted. It wasn't. The first *i* in the line was in the word "kind" and *ed* changed it to uppercase. The next command I used was the *u* for undo. Entering the commands

u

p

caused *ed* to undo the previous change and print out the current line again. (By the way, commands can be strung together, so I could have entered

up

with the same result.)

Next, entering the command

s/ i/ I/p

caused *ed* to make the correct change and redisplay the line for verification.

The next error is in line 3. The word *say* was misspelled *asy*. This time let's make the change in one line. The idea is to go to line 3, replace *asy* with *say* and print the result. The command

3s/asy/say/p

accomplishes the task.

Now, let's use a regular expression instead of a line number to locate the next change. The word *avoid* is spelled *avoyd*. The following command instructs *ed* to find any line that contains *avoyd* and then substitute *avoid* for *avoyd* in that line.

/avoyd/s/avoyd/avoid/p

Again the result is printed because of the *p* command appended to the substitute command.

Regular Expression Shorthand

There's a shorthand involving regular expressions. If a null string appears where a regular expression is expected, the last regular expression is used. You can take advantage of this by using the following command line to replace *wnat* with *want*.

/wnat/s//want/p

The first expression in the substitute command is null; therefore, the previous expression (*wnat*) is used.

One last change with the substitute command. My editor said that I shouldn't capitalize the name *ED*. It occurs multiple times, but the single command

1,\$s/ED/ed/g

will fix all occurrences. The address portion of the command is *1,\$*. A *\$* in the address field indicates the last line of the file, so *1,\$* refers to all lines. The *g* at the end says perform the command on all occurrences of the string in a line. Without the final *g*, only the first occurrence of *ed* in each line would be changed. If you want to print all lines that were changed, just add a *p* command.

1,\$s/ED/ed/gp

These are the basic capabilities of *ed*. All of the capabilities of *grep*, as described in last month's column, exist in *ed*. This means that you can search for patterns involving the regular expression metacharacters. The main difference

is that *ed* also allows you to make changes by including these expressions in the substitute command.

If you want to explore all the capabilities of *ed*, I recommend the two papers by Brian W. Kernighan on *ed* that come with most Unix systems: *A Tutorial Introduction to the UNIX Text Editor* and *Advanced Editing on UNIX*. Also, Chapter 3 in the book *The UNIX System* by S.R. Bourne is terse but excellent and covers both *ed* and *vi*.

Visual Editor Described

The second editor I'm going to describe is *vi*, the visual editor from the University of California at Berkeley. Notice I said *describe*, not teach you how to use. *Vi* is a massive editor that has commands to do almost anything. When I'm teaching *vi* to someone, I tell them if they use three keystrokes to accomplish a task, they're doing it the hard way. This is not always the case—but it's close.

The *vi* program can be invoked in four different ways: as *vi*, *view*, *edit* or *ex*. Normally, you call it with *vi*, which tells the program that you want to use the fancy, full-blown screen editor. *View* acts the same but opens the edit file for read only. This is handy when you want to look at a file but want to make sure you don't modify it.

Ex works like *ed*. It has a larger buffer, some of the key mapping features of *vi* and possibly an extra error message but otherwise is just like *ed*. *Edit* is much like *ex* but with a more human interface. When you edit a file, it displays the filename and character count, not just a number. It also prompts with a colon when it's waiting for a command. If you want to learn how to use *ed* and you have access to a system with *edit*, try it. It's much easier to deal with.

Window-Related Features

If you're not familiar with a screen editor, what it does is dis-

This is a test file to see if ED is a real editor, the kind i like. Some say that Ed is cryptic and confusing to use. Others asy that ED is powerful and easy to learn. Still others just avoyd it. Give ED a chance. It might do just what you wnat.

Table 2. Contents of original test file.

This is a test file to see if ed is a real editor, the kind I like. Some say that ed is cryptic and confusing to use. Others say that ed is powerful and easy to learn. Still others just avoid it. Give ed a chance. It might do just what you want.

Table 3. Edited test file

**When I'm teaching vi,
I tell them if they use
three keystrokes to
accomplish a task,
they're doing it the
hard way. This is not
always the case—but
it's close.**

play a section of the file you're editing on the terminal and allow you to move about and modify this section. The section is generally called a window, and you can move this window by using various commands. In *vi*, there are commands to move the screen forward or backward within the file in either lines, half screens or full screens. Each of these commands can be preceded by a count so that you can move a specified number of lines, half screens or full screens. For example, to move forward five screens, you enter the command

5^f

where ^f represents a Control-F.

A second alternative with window positioning is to specify a search pattern. For example, the command

/framus/z.

will search forward in the file for the string *framus* and position the string at the middle line of the screen. There are options to position at the first or last line also.

One other window-related feature is the ability to specify the size of the window. This is useful if you're using a slow terminal. You can specify a smaller window and decrease the time it takes the system to redisplay the window.

To move within the window, there's a multitude of options. The single letter commands *H*, *M* and *L* move you to the first, middle and last line of the screen, respectively. Arrow keys (and numerous other keys as well) move you up and down one line and left and right one character. The up and down commands cause a one-line scroll if you're at the edge of the window.

Other commands allow you to move to the beginning (0) or end (\$) of the current line. You can also move a specified number of characters to the left or right or to a specified line or column.

Text Insertion

To insert text, *vi* offers six options. You can insert after the cursor (*a*), at the end of the current line (*A*), before the cursor (*i*), before the first nonblank character on the current line (*I*), below the current line (*o*) or above the current line (*O*).

These are some of the basic commands of *vi*. Let's look at the fancy ones that make *vi* handy for editing text as well as programs. There are commands to move forward and back one word, sentence, paragraph or section. Any of these operators can be preceded with a number that lets you repeat that command the specified number of times. For example, to move backward 11 words, you would enter

11b

You can also move as a function of what is found in the file. For example, to move forward to the next comma in a line, enter

f,

For programmers, probably the handiest command is the single percent sign (%). When the cursor is positioned on a left or right parenthesis, bracket or brace, and you enter the percent command, *vi* positions to the matching closure.

All of this leads us to *vi*'s next feature. Any of these movement and search commands can be used in conjunction with the change and delete commands. For example, if you want to delete everything that's enclosed in a set of parentheses, position to the open or close parenthesis and enter

d%

A more common example is the replacement of a word. The command

cw

instructs *vi* to replace the current word with whatever text is entered. The space is automatically adjusted to fit the new text.

The capabilities go on from here and include:

- map keys to functions
- form abbreviations

Let's look at the fancy commands that make *vi* handy for editing text as well as programs. There are commands to move forward and back one word, sentence, paragraph or section.

- copy and move blocks of text
- shift blocks
- retrieve previous deletes

A number of options also can be set when you enter *vi* or put into the file .*exrc* in your home directory. These allow you to set tabs, change the window size, automatically wrap words when they reach the end of a line and more.

If you have access to the manual set from the Berkeley Software Distribution, look for the paper *An Introduction to Display Editing with Vi* by William Joy. Yes, that's the Bill Joy who is now at Sun Microsystems. It's a terse 32 pages of what exists in *vi*. You'll probably find that you'll pick the subset of *vi* commands that you commonly use and ignore the rest. I try to add a new one to my vocabulary from time to time.

Now for a plug—my company, SSC, publishes a series of Unix references. One is a reference card for *vi*. It's pocket-sized, eight pages and summarizes all of the *vi* commands. I use it. If you're interested, it costs \$2.50 postpaid from SSC. The address is at the end of the column.

July S/ug

David Perlin of Microsoft Corp. spoke at the July meeting of the Seattle Unix Group (S/ug). The subject of his talk was Xenix 3.0 implementation. It was well-organized, nicely presented and not a

sales pitch. In addition, I really enjoyed talking to David after the meeting. It's nice to see there are real people at Microsoft.

Xenix 3.0 is based on Unix Release III with a whole bunch of Microsoft enhancements. It's currently available on the Intel 286 with at least a 68000 version soon to be available. Here's a short list of the extensions:

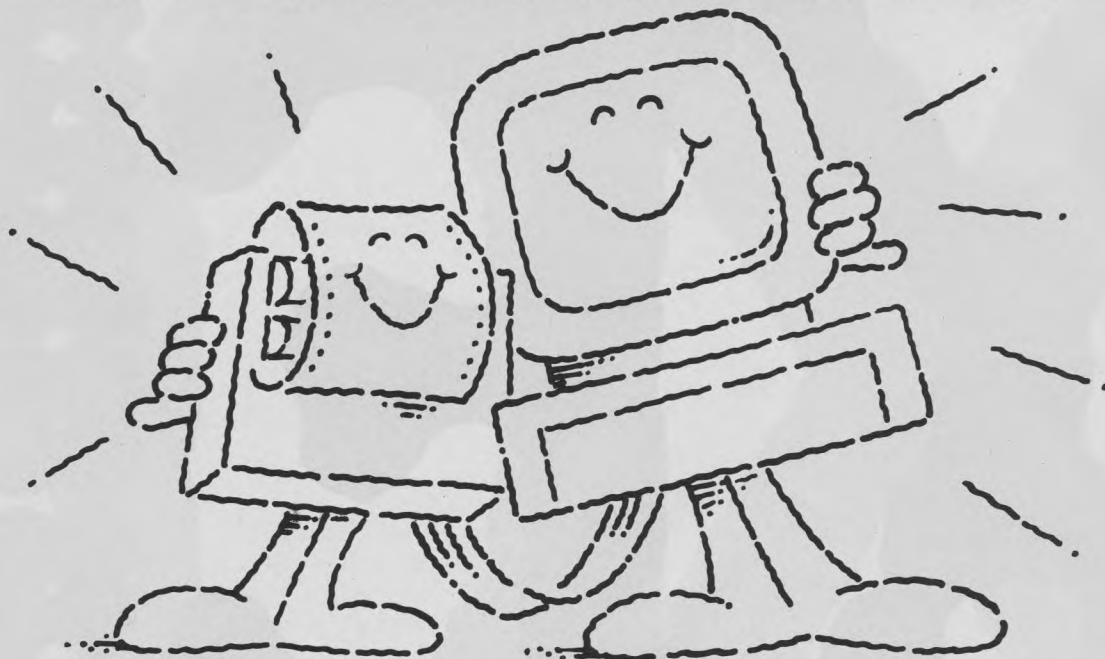
- MS DOS disk read/write utilities
- C Shell and VI (VAX version)
- Visual shell—a menu-oriented shell that can be configured to handle menu-type applications
- Shared memory for interprocess communications
- Nonblocking reads—this means that you can determine if there's something to read instead of having to wait for a read to complete before your process can continue
- Record locking
- New manuals—not just reprints of the Bell documents
- New C compiler and MS DOS cross-development support on the 286 version only
- A new networking protocol (MICNET) that's supposed to be much more efficient than uucp (but incompatible).

Future meetings will feature speakers from various manufacturers. Current plans are for Plexus in November and Pyramid in January. Pyramid plans to talk about its reduced instruction set computer (RISC) architecture. Should be interesting. Are there any other Unix groups out there? Let me know who you are and what you're doing.

Next month's column was on document processing. I talked about *nroff*, *troff* and some of the support programs that allow you to write and even typeset documents on a Unix system. I also had a request for a comparison of the various versions of Unix. A column on that was in the works. The best laid plans of mice and men. . . □

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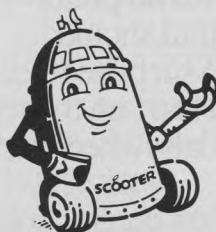
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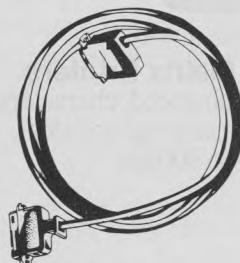


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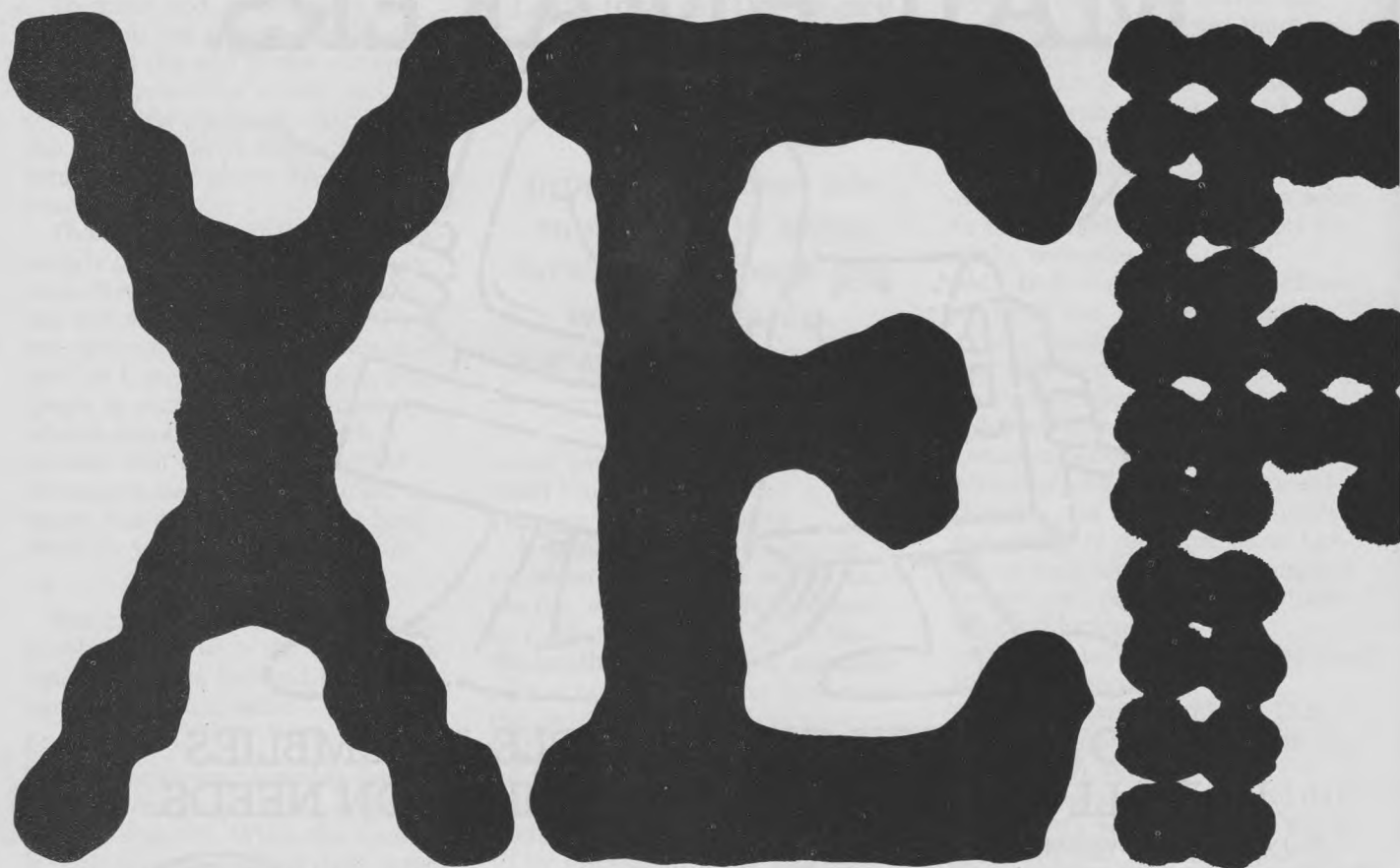
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Soup Up WordStar On Sanyo's MBC-550

If you're looking to speed up WordStar editing functions on your Sanyo, this article will help you revise the WS.COM program file and really get things rolling.

By Richard Kruse

The good news about the Sanyo MBC-550 series of personal computers has spread. Since the introduction of these low-priced MS DOS machines several months ago, many users have praised Sanyos' exceptionally high performance/price ratio, reliability and low out-of-box failure rate. I certainly have no major complaints about my two-drive MBC-550, and I've been able to heartily recommend a Sanyo system to clients and friends.

High Quality Software

One of the most welcome aspects of the Sanyo MBC-550 (and even more of the MBC-555) is its high-quality bundled software. The package currently being shipped with the Sanyo computers is well-known throughout the industry as the Micropro International Star series, of which the WordStar word processor is the most ubiquitous. The Sanyo implementation of WordStar (I'll

also refer to it as WS) is the Real McCoy, version 3.30, with all features intact.

WordStar has been deftly integrated with the MBC-550's hardware features: Function keys and cursor keys produce their expected results; the standard parallel output port supports either a Sanyo printer or any of several common generic printers (via the Install program); and inverse video is implemented on the display for WS's normal highlighting functions.

A Tale of Woe

As a longtime user of WordStar on another system I'm greatly disappointed by one aspect of the Sanyo implementation: it's *slow*! Compared to my other system (an ancient 4 MHz Z80-based system with a memory-mapped video board), all WS operations seem to be slowed down by a factor of two, three or more.

Worst of all, however, is the video screen update rate: on the Sanyo, a page-up or page-down operation, which rewrites the entire screen, takes an agonizing four seconds to complete. My old eight-bit machine, by way of comparison, zips through the same function literally in the

blink of an eye—too fast to be timed manually! This is progress? In fairness, WordStar's overall performance on the Sanyo MBC-550 is in the same ball park with the IBM PC implementation.

There are several reasons for this poor performance, most of which are beyond your control. Reasons include the inefficiencies of the eight-to-16-bit translation process that has been applied to WordStar, the Sanyo's relatively slow clock speed, its lack of DMA (Direct Memory Access) for disk or video functions and the complexity of its three-plane pixel-oriented video display system.

A Glimmer of Hope

One implementation-related aspect that you can do something about will result in a significant performance improvement. Sanyo's WordStar is a generic version that runs on a variety of IBM-compatible computers; thus it may ignore certain advantageous features available on a particular system. Such is the case with the Sanyo: the full capabilities of the video display system aren't recognized, with a resulting penalty in overall performance.

Specifically, WordStar treats the

Sanyo display system as if it were a dumb terminal device, one with no built-in line editing capability. This results in slow operation when WS does a midscreen insert or delete operation; the entire screen must be rewritten from top to bottom.

Actually, the Sanyo video driver system (in BIOS) can easily perform functions that will simulate line insert, line delete and erase-to-end-of-line (EEOL) anywhere on the screen. If you can tap into these functions and let WordStar know that they're available, its midscreen editing functions speed up by a factor of ten or more!

A Formula for Success

The necessary modifications are not at all difficult—using this article and a short session with your system debugger program, you can duplicate them. You'll end up with a new, slightly revised version of the WS.COM program file with the modifications permanently stored in it. If you use WordStar often, you'll wonder how you managed with the old, slower version!

I'm assuming that your Sanyo computer is an MBC-550 or 555, and that your version of WS is identified in the sign-on message as version 3.30. If your IBM-compatible computer isn't a Sanyo or your version of WS has a different number, read on anyway—you still may be able to use the information or adapt it to your own needs.

Preparation

As already mentioned, the object of this article is to create a new, modified WS.COM program file on disk. Before embarking on the project, you'll need to prepare a "scratch disk," which will hold your program during modification and testing. Do not attempt to rewrite any of the files on any of your master disks! Be aware that mistakes will happen: a single character mistyped under the

debugger may result in a totally unusable copy of a file!

Your scratch disk will need to have the entire WordStar system (WS.COM, WSOVLY1.OVR and WSMGS.OVR) as well as a text file or two for test purposes. The easiest way to create the scratch disk is to use Diskcopy to duplicate the main WordStar master disk. I won't go into detail on this; instructions are in your user's manual.

You'll be using the system debugger, called DEBUG.COM, which is found on your MS DOS system disk. You need not copy the debugger program, since the system disk can be temporarily inserted in order to load the debugger. I'll assume you're using a single-drive system, so that the same set of instructions applies to everyone.

Finally, don't fret if you've never used machine language before, or even if you haven't tried the debugger. All you really need is the ability to type carefully and follow instructions. (The source code and a flow-chart are included for those who understand such things.)

Performance Booster

The simple speed-up modification is made possible by WordStar's inherent "smarts." If WS is informed that the terminal it's talking to can do line editing functions, it automatically invokes these functions over the old slower methods whenever they're appropriate. This includes any condition that inserts or removes a line of text from the screen, some scrolling functions and other miscellaneous situations.

Here's the general idea of how to make it happen. WordStar has a small internal patch area, put there for the use of system integrators who need to write special routines such as I/O drivers. I've designed a short routine that will properly access the Sanyo BIOS functions and, using the system Debug program,

you can insert it into the WS patch area. The routine will watch all characters normally sent to the screen. The usual displayable ones will simply be passed along to appear on the screen, but three special control characters will be trapped to activate the new functions. Finally, you'll tell WS that the new functions are out there, and what characters to send to activate them: knowing this, WS will take the appropriate measures to use them.

Simulating Line Edit Functions

Included in the Sanyo BIOS are routines that will scroll any portion of the video screen, either up or down, by one or more text lines. These routines are all you need to insert or delete a line—almost.

To insert a line, you need to scroll down, by one line, all screen lines from the first character of the line containing the cursor to the 80th character of the 24th line (you don't want to disturb the 25th line, which doesn't contain normal text). The BIOS scroll routine will do this and will roll a blank line into the top of this window, which is just fine.

To delete a line, the procedure is the same, except that the scroll direction must be up. Again, BIOS can handle this and will roll a blank line into the vacated 24th screen line.

BIOS conveniently has a function that will determine the present cursor position, and still another suitable for EEOL. This is going to be easy!

As always, there's a small fly in the soup. Fortunately, WS is pretty smart and doesn't mind if the terminal fudges a little on these functions (details to come). That will solve the problem, and, as it turns out, the task really is a snap.

BIOS Video System

From WordStar (or any other machine language program), the entire Sanyo video system in BIOS can be

accessed by executing a software interrupt, specifically, an INT 10H instruction. To select just which of the many video functions will be performed, I pass a function number in the 8088 AH register (refer for all of this to your Sanyo user's manual, section 5, page 22). Here are the ones that are of interest right now:

- Function 3: Read cursor position—Set AH equal to 3 (never mind BH; there's only one video page) and do an INT 10H. When control returns, the DH register will contain the row number and DL will contain the column number of the current cursor position (both relative to zero).
- Function 6: Scroll up—Several registers must be set: AH = 6 (function number), AL = 1 (scroll by one line),

BH = 7 (standard video attribute), CH = uppermost row to scroll I (use the current cursor row), CL = 0 (leftmost column to scroll, always zero), DH = 24 (lowermost row to scroll, always 24), DL = 79 (rightmost column to scroll, always 79). When all are set, do INT 10H.

- Function 7: Scroll down—Same register settings as function 6, except register AH (function number) = 7. Then do INT 10H.
- Function 9: Write character(s) at cursor position—Use this for the EEOL function. Registers must be set up as follows: AH = 9 (function number), AL = 32 (ASCII "blank" character), BL = 7 (standard video attribute), CX = number of characters to write, use (80 minus current

```

0717:02E0 3C 01      CMP AL,01      ;test for EEOL
0717:02E2 74 0B      JZ 02EF
0717:02E4 3C 02      CMP AL,02      ;test for INS LINE
0717:02E6 74 09      JZ 02F1
0717:02E8 3C 03      CMP AL,03      ;test for DEL LINE
0717:02EA 74 05      JZ 02F1
0717:02EC E9 63 2B    JMP 2E52      ;else norm dsply
0717:02EF F6 D8      NEG AL
0717:02F1 53        PUSH BX
0717:02F2 50        PUSH AX
0717:02F3 B4 03      MOV AH,03
0717:02F5 CD 10      INT 10
0717:02F7 B1 50      MOV CL,50
0717:02F9 2A CA      SUB CL,DL
0717:02FB B5 00      MOV CH,00
0717:02FD 9D        POPF
0717:02FE 78 16      JS 0316
0717:0300 8A EE      MOV CH,DH
0717:0302 B1 00      MOV CL,00
0717:0304 B8 01 07    MOV AX,0701
0717:0307 72 03      JC 030C
0717:0309 B8 01 06    MOV AX,0601
0717:030C BA 4F 17    MOV DX,174F
0717:030F 3A EE      CMP CH,DH
0717:0311 72 06      JC 0319
0717:0313 B9 50 00    MOV CX,0050
0717:0316 B8 20 09    MOV AX,0920
0717:0319 BB 00 07    MOV BX,0700
0717:031C CD 10      INT 10
0717:031E 5B        POP BX
0717:031F C3        RET

```

Listing 1. Source code for WordStar booster patch. Note that segment # (0717) may not be same for all systems. (All numeric values in hexadecimal notation.)

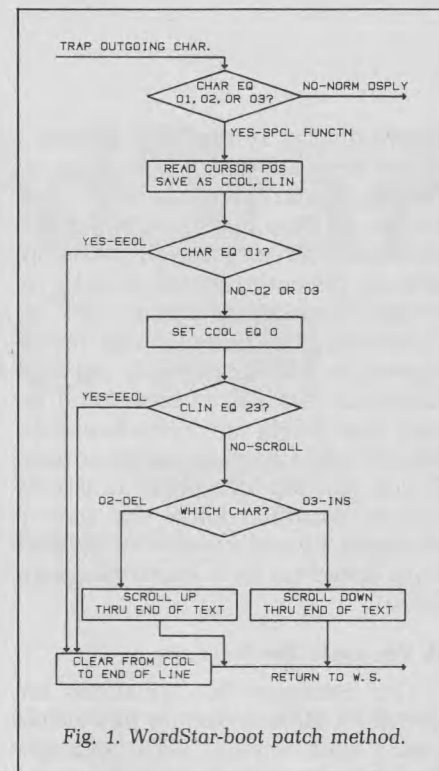


Fig. 1. WordStar-boot patch method.

cursor column). Then do INT 10H.

Many more video functions are available, but these four will accomplish everything necessary for the WordStar upgrade. The one catch to this scheme is that WS will often deliver the insert or delete command with the cursor in the 24th (last text) screen line, and BIOS doesn't like a scroll instruction in which the uppermost and lowermost row numbers are the same. BIOS dislikes it so much, in fact, that it will quietly crash your system—WS will then go away, and nothing short of a total reset will be accepted.

This stumped me for a while, until I realized that, under this one condition, WS is happy if the 24th line is simply cleared and no actual scrolling takes place. All that's necessary, then, is for the routine to test if the current cursor line is 24, and, if so, do an EEOL of the entire line instead of a scroll. So help me, it works.

Fig. 1 shows the final flowchart I came up with and Listing 1 is the


```

0717:0260 00 00 00 00 00 90 C3 06-01 00 00 00 00 01 01 00 .....C.....
0717:0270 00 00 00 00 00 01 02 00 00-00 00 00 01 03 00 00 00 .....

```

Listing 2. WordStar patched function-code area. (Underlined bytes must match exactly.)

corresponding 8088 instruction sequence. I rather arbitrarily chose character codes 01, 02 and 03 for EEOL, Delete line and Insert line, respectively. The WS patch area starts at CS:2E0H, and that's where to put the code (there's plenty of room).

Installing via Debug

Now, as promised, here's the actual method for installing the WS patch via Debug. (You did prepare a scratch disk, right? If not, do so now!)

Boot DOS as usual, insert (your back-up copy of) the MS DOS system disk into drive A: and invoke the system debugger by typing `DEBUG<RET>`. When the Debug prompt appears, remove the system disk, place it aside and insert your prepared scratch disk.

Begin typing the following command lines. Type them exactly as shown, one line at a time, waiting after each `<RET>` for the prompt to reappear. (Be sure to include all space characters in the command lines. The characters may be typed either in uppercase or in lowercase.) Don't type the comment lines; they're shown only for your benefit.

Type: `N WS.COM<RET>`
Type: `L<RET>`

Comment: Loads the raw WS.COM program file from disk into the debugger's workspace.

Type: `E 26D 1 1<RET>`
Type: `E 274 1 2<RET>`
Type: `E 27B 1 3<RET>`
Type: `E 2E4B E8 92 D4<RET>`

Comment: Informs WS that the new

functions are available, establishes their command codes and sets up the call to the patch. Before proceeding further, review your work up to this point with the Dump and Unassemble commands:

Type: `D 260 27F<RET>`

Comment: The resulting two-line memory dump should look like what is shown in Listing 2. Most bytes will probably be the same, but the underlined ones must match exactly.

Type: `U 2E4B 2E4B<RET>`

Comment: You should see `CALL 02E0`. If you've made any errors, reset your system, then reload the debugger and start again from the beginning.

When you're satisfied that all is correct, type in the following long command strings, which insert the actual patch code. You should type each string on a separate line.

Type:
`E 2E0 3C 01 74 0B 3C 02 74 09 3C 03 74 05`
`E9 63 2B F6 D8<RET>`
`E 2F1 53 50 B4 03 CD 10 B1 50 2A CA B5 00`
`9D 78 16<RET>`
`E 300 8A EE B1 00 B8 01 07 72 03 B8 01 06`
`BA 4F 17 3A EE<RET>`
`E 311 72 B6 B9 50 00 B8 20 09 BB 00 07 CD`
`10 5B C3<RET>`

Comment: That's all. To check the code you've just inserted,

Type: `U 2E0<RET>`

Comment: This will unassemble one screenful of code. Check it against the first part of Listing 1. Next,

Type: `U<RET>`

Comment: You'll see the rest of the code. Check it against Listing 1.

When you're convinced that all modified bytes are exactly right, the only remaining step is to resave your new WS to disk, so that your modifications will "come back" whenever you run the program. To save the code, just

Type: `W<RET>`

and you're done. You can now exit from the debugger (use the `Q` command) and test WS—just run it as usual (you'll probably want to use a prepared text file for this). There are no new commands or tricks to learn, and you'll immediately see the difference in speed whenever a partial-screen scroll is called for.

If any WS function works incorrectly at this point, you've probably made a typing error under Debug. If so, there's no recourse but to try the whole process again from the beginning. Be sure to start with a fresh copy of WS.COM, since you may have inadvertently changed a byte at some unknown location in the modified version.

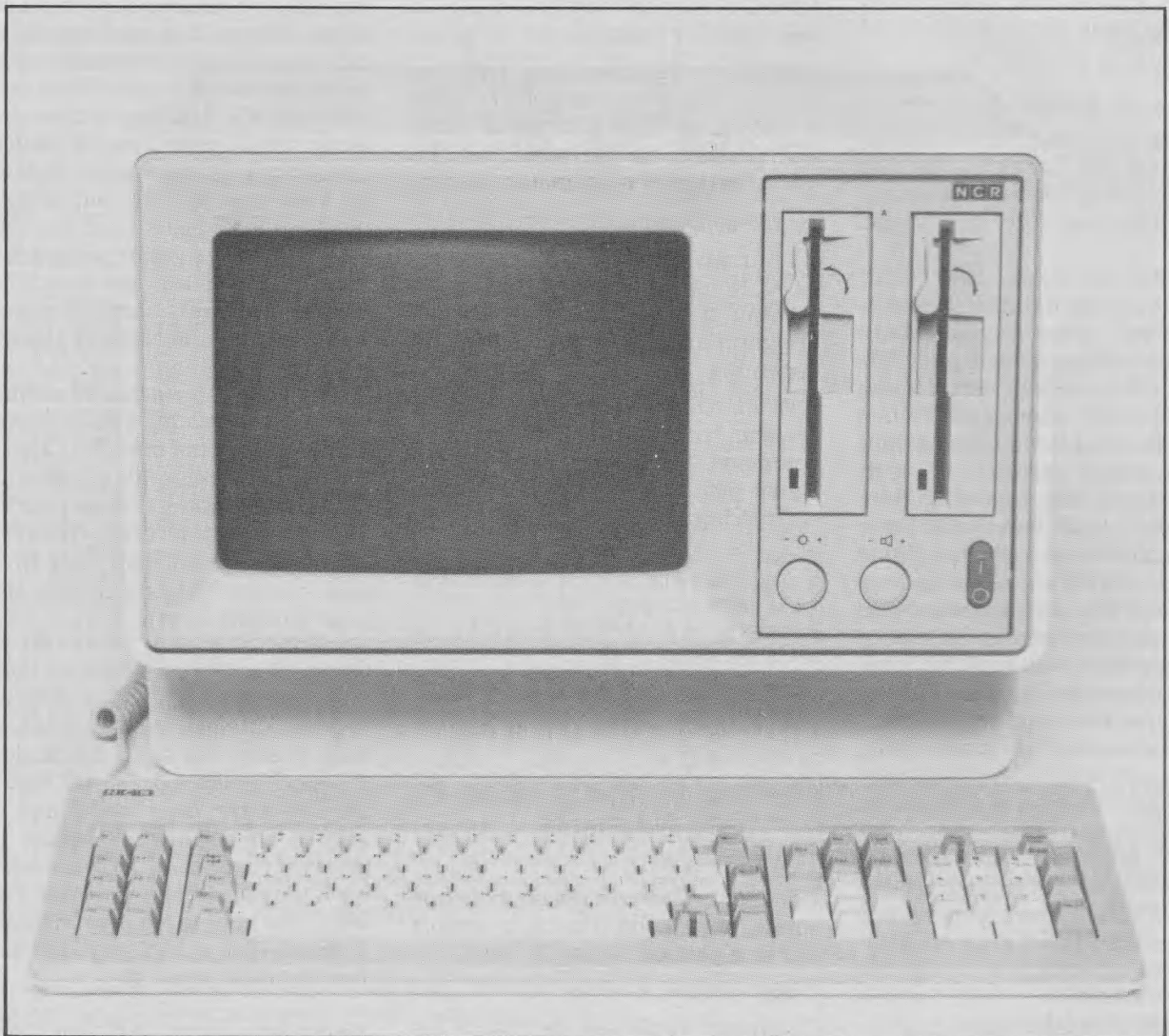
When you're sure that WordStar is working correctly, you'll want to either transfer the new WS.COM file to your usual WordStar system disk or treat the scratch disk as your new WordStar system disk. Always be sure to save a back-up copy of this new file, for catastrophe may strike your working copy!

I hope that you've found this Sanyo/WordStar information useful and you'll give it a try on your own system. Although WordStar is beginning to show its age a bit (and yes, it's hard to learn), it's still high on the list of the most useful and reliable of all personal computer programs. For those of us who depend on it, any small enhancement translates into time saved and frustration averted—not a bad payback for a few minutes' work! ■

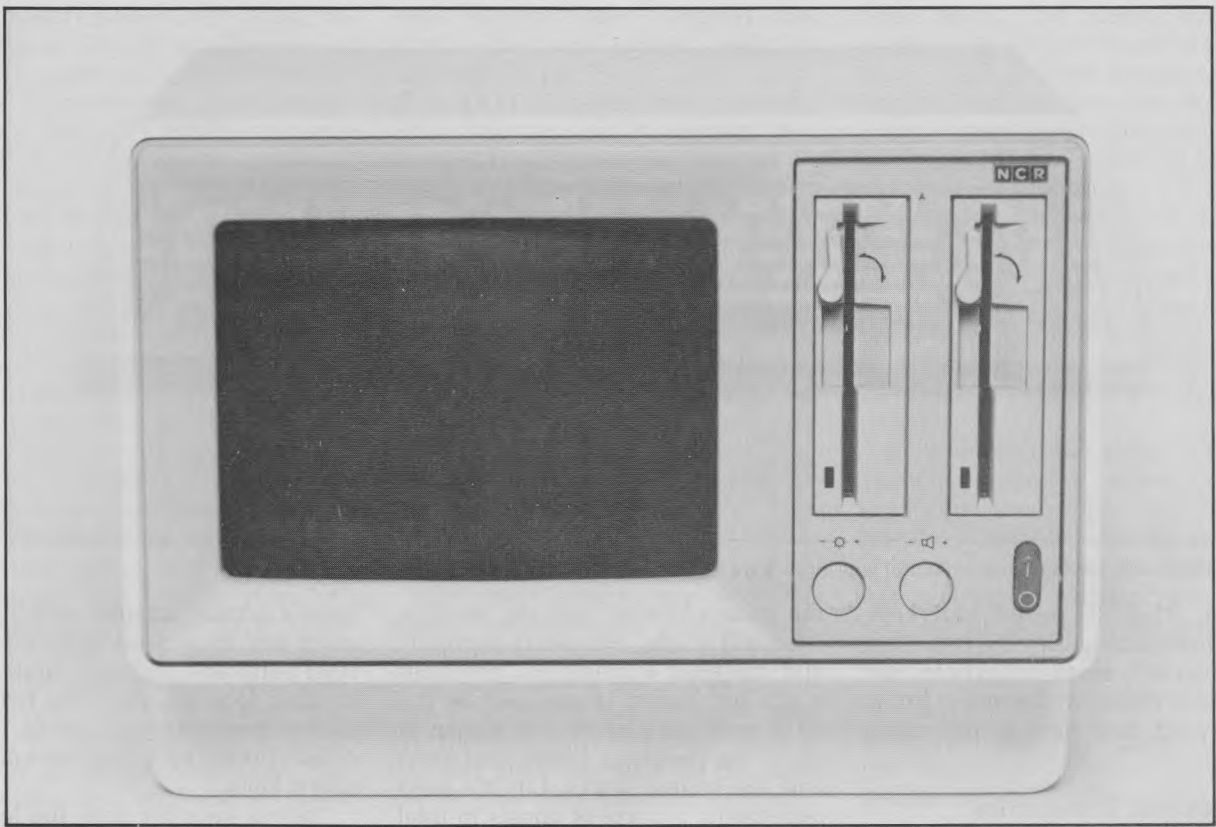
Address correspondence to Richard M. Kruse, 6221 Woodlow Drive, Wichita, KS 67220.

The NCR Model 4: A Competent Clone

By Eric Grevstad
Senior Writer



NCR's Model 4 puts average ingredients—128KB RAM, two floppy drives, an 8088 processor—into a stylish package that's more than average.



"A white whale with a bland beige face rearing up at eye level": the NCR's periscope-style system unit.

All right, it's a clone. But let's not jump to conclusions. No, the NCR Model 4 does not have a true 16-bit microprocessor. It doesn't run at eight MHz; it doesn't have a standard math chip or color monitor or hard disk or tape backup; it can't do graphics. It comes with only 128KB RAM and no bundled software. It's the least portable computer I've seen in months.

Well, what's so bad about being a clone? The IBM PC recipe—an Intel 8088 and some memory, two drives, a screen and a keyboard—is the most copied, most significant design in computing history, and the NCR is a polished performance of the same old song.

It's attractive, it's quiet, it runs all the name-brand software; it's got a great keyboard and a nifty implementation of MS DOS 2.11, and NCR didn't forget the parallel and

serial ports. The Model 4's a bit overpriced, but it's a likable machine. It's a clone you can be proud of.

It Looks Like a Picnic Cooler

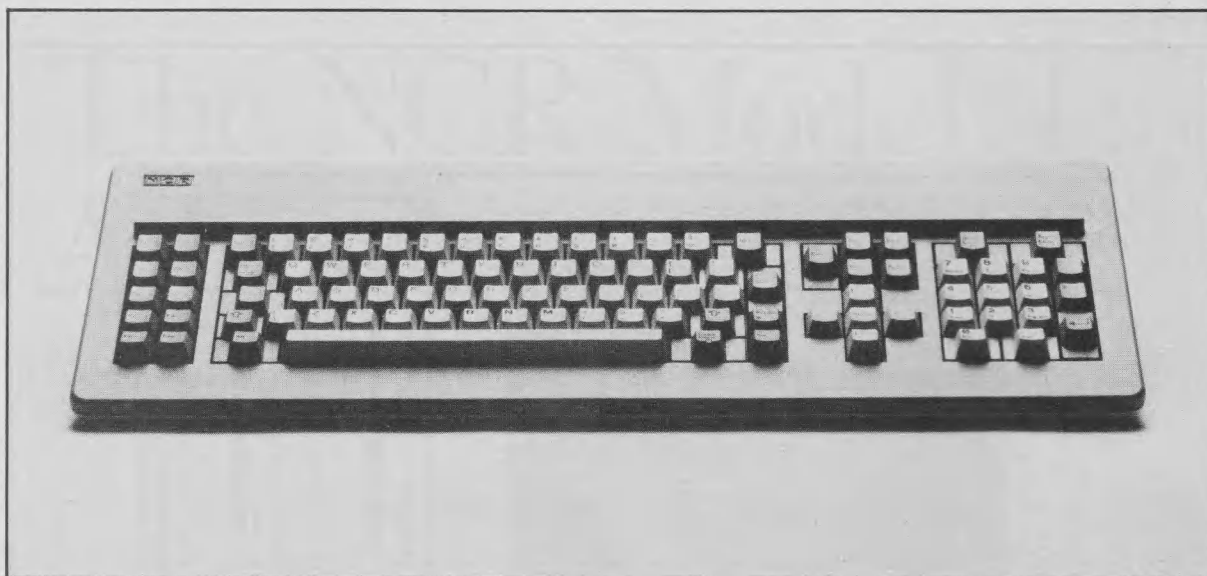
The Model 4 (why did NCR name its new flagship after a TRS-80?) is an update of the Dayton, OH, firm's Decision Mate V, a Z80A-based CP/M system with an optional 8088 board. Both micros are housed in a periscope- or Apple Lisa-style case; NCR advertises the unit's small footprint (18 × 15 inches less keyboard), which belies its bulky appearance. At first glance, the Model 4 looks like a monolith (said one observer, "It has the footprint of a refrigerator"); by actual measure, it takes a few inches less space than an IBM PC and considerably less when not in use (you can slide the keyboard partially under the system unit).

Its hardware is unexciting: the

usual 8088 CPU with a 4.77 MHz clock rate, 8KB of BIOS and memory-test ROM and 128KB RAM, with space on the motherboard for another 128KB RAM and an 8087 math coprocessor. I installed the former, a matter of inserting 18 RAM chips and poking some dip switches; the NCR's not the world's easiest machine to work on—the motherboard's vertical (chips and cards go in horizontally). You can tilt the unit forward to rest at an angle on its nose, but I wasn't crazy about the idea.

Still, there's adequate room to grow—three vacant full-length expansion slots (the CRT controller takes a fourth and the floppy disk controller a shorter fifth slot). With up to 384KB on a memory expansion card, the Model 4 can become a 640KB machine.

Next to the expansion area are



The Model 4's double set of control and arrow keys gives extra convenience.

parallel, RS-232C serial and keyboard interfaces; they're recessed wrist-deep in a small cubbyhole, but I'd rather reach awkwardly for a parallel port than have to pay extra for one.

Esthetics and Ergonomics

Turning to the front of the NCR, there's its distinctive styling to consider. Taking it out of the box, I thought the Model 4 was ugly, a white whale with a bland beige face rearing up at eye level. After using it for a few hours, I decided it was quite handsome.

Notably, its combined monitor/CPU design beats the usual stack of PC pieces. The two vertical drives are quiet (aside from a faint whistling at startup and the usual grinding over copy-protected disks' bad sectors), and their lights are easy to see; I found inserting and removing disks at screen height, rather than sliding them into drives at keyboard level, an easier move. The on/off switch is right up front where it belongs, and the cooling fan is almost inaudible.

The front panel also has control dials for display brightness and audio volume. The sharpness of the 12-inch green phosphor monitor is average for text displays, but the stock Model 4 flunked MC's graphics test:

the monochrome Compaq handles Atarisoft's *Ms. Pac-Man* perfectly and the IBM Portable PC produces a grainy, fuzzy image, while the NCR puts nothing on the screen at all. (The program loads and runs and the sound works, but it's hard negotiating a maze of ghosts in total blindness.)

If you expect to do any graphics work, you'll have to buy an add-on board from STB, Tecmar, Plantronics or whomever. There's also a Model 4 with a color monitor that promises 16 colors at an unspectacular 320 × 200 resolution (640 × 200 in monochrome). The NCR is thoroughly PC compatible, but it's no Tandy 2000- or Mindset-style showoff.

The Keys to Success

My favorite Model 4 feature is the keyboard—much lighter, 2½ inches wider and twice as useful as IBM's. Its light-weight and lighted number lock and caps lock keys are nice, but the keyboard's real bonus is a separate compass of arrow keys, in addition to those on the numeric keypad, giving separate keyboard areas to cursor movement and number entry. The idea is similar to the TI Professional's, but the layout is better.

With number lock pressed, you

have a normal keypad with its own enter key as well as numerals, decimal point and plus and minus; with number lock off, you have two each of the four arrows, control, insert, delete, home, end, page up and page down keys.

Control keys for both the left and right hands make executing application commands a joy. My only complaint is that I quickly grew so used to the control key above the cursor compass, by my right hand, that I almost forgot the one on the left, fumbling some usually one-handed commands like Ctrl-A, -F and -T.

The keyboard's feel is a match for its design: it's plastic, as opposed to the IBM's metallic feel, but not the least bit mushy; it's not silent like Compaq's, but not deafening like Big Blue's either. It's certainly light enough (and its cord, though attached to the NCR's rear panel, is long enough) to keep in your lap; even better, it's wide enough to rest on the arms of my desk chair, giving me a stable platform for fast typing. That made me feel a little like a kid in a high chair, though.

Information, Manual and Automatic

My review Model 4 came with four manuals—owner's, technical

reference, NCR DOS 2.11 (a version of Microsoft's MS DOS 2.11, of course) and GW Basic. The books are good, particularly for beginners (there's a chapter on introductory computer concepts in the owner's manual), and there are indexes and glossaries galore, but I brushed past them to try the NCR's copious software-based instruction. Again, it's more for beginners than hackers—you can't actually use your DOS master disk, for example; when it's booted, it automatically starts Diskcopy and guides you through making a backup—but it's quite impressive.

Even rookies will quickly forget NCR Pal, a kindergarten tutorial disk that cracks bad jokes (though I liked its introduction, at the end of a keyboard commands lesson, of "The Biggie—Don't do it! [Ctrl-Alt-Del.] Don't do it!"). The NCR Tutor disk, however, is a menu-driven course that matches any Cdex-style training program; from a first look at DOS, it climbs to advanced instruction in batch commands, the Edlin editor and redirection, pipes and filters.

And, in return for not fitting GW Basic on the same disk, NCR DOS provides a superlative on-line help utility. Entering Help from the system prompt brings a menu of 36 DOS functions, from Assign to Vol; as you wander through it with the arrow keys, a one- or two-line description of the highlighted command appears in a dialogue box. Pressing the enter key brings a complete description, explanation and examples of the command—two or more screens of detailed information, matching anything in most computer manuals.

A Speedy Bonus

Experienced programmers will begrudge the help files' disk space, but they'll be consoled by one DOS feature that's not for novices: if you can tackle Edlin and create a Config.Sys file on your disk, you can set aside any amount of the Model 4's memory (except for 64KB plus DOS requirements) as one or more RAM disks.

Various defaults and setup instructions let you mimic a regular disk (single- or double-sided, eight or nine sectors per track), simply specify a RAM disk size, or, contrarily, define the amount of memory that the RAM disk must not use.

RAM disks work best in 256KB or larger machines and they're emptied when you turn the computer off (though they're automatically installed when you boot a floppy with the proper Config.Sys file), but they're fast enough to make setup chores worthwhile. Copying my word processor onto the RAM disk every morning took a minute, but seeing it load in two seconds was always a pleasure.

Not the Cheapest

With such features, the NCR can almost compete with newer, faster desktops like the 8086-based AT&T. Its biggest flaw is its lack of graphics; if it had good monochrome graphics like the Compaq, I'd call it the best 8088 machine on the market. If you can afford a graphics card, it's the best—nothing to swoon in high-tech ecstasy about, but cause to lift a toast toward Ohio and say, "Well cloned."

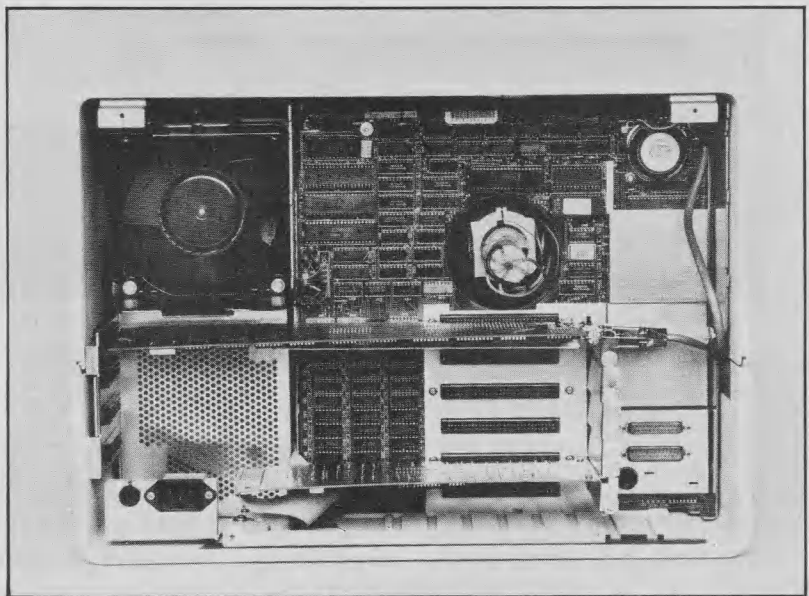
However, as much as the keyboard, quiet fan, standard interfaces, RAM disk and help functions boost

its value, I'd say its price should come down. The 128KB, two-drive Model 4 is almost worth its listed \$2825—and product manager Bruce Langos told me he expects a discounted street price—but buyers will be mesmerized by IBM's lure of \$1995 for a 256KB PC. Of course, adding a second drive, a display/printer adapter and a monitor will bring the IBM to \$2945 (and still no serial port), but all the pressure's on NCR—and on Columbia, Corona and the other clone makers, who aren't above resorting to fire sale prices.

NCR doesn't call itself "the 100-year-old computer company," stressing its business supply experience as National Cash Register, for nothing. If it would agree to put about \$500 less cash in its registers per Model 4, a lot of people could be happy with its machine. ■

Manufacturer: NCR Corp., Dayton, OH 45479.

Prices: Model 4 with 128KB RAM, monochrome monitor: \$2400 (one floppy drive); \$2825 (two floppy drives); \$4486 (one floppy, 10MB hard drive). With color monitor: \$2874 (one floppy); \$3299 (two floppies); \$4960 (one floppy, 10MB hard drive).



The backless Model 4. Note the vertical motherboard and horizontal disk controller.

TANDY



Tandy is the Rodney Dangerfield of the microcomputing world. Although it's the third most successful company in the field (behind only Apple and IBM), Tandy doesn't get the respect it's due—thanks largely to its Radio Shack image. However, with the Tandy 2000 leading the way, the folks in Texas are planning a comeback—even though they've never left.

By Eric Grevstad, Senior Writer

Success Isn't Enough!

It's going to be an uphill fight. Tandy Corp./Radio Shack recently announced a special "Advanced Technology Series" designation, to apply to such items as the Model 2000 computer and a \$400 digital audio disk player—less than one percent of the electronics retailing giant's inventory, honored for either state-of-the-art hardware or high-tech affordability. When the news reached the *Microcomputing* office, one editor couldn't resist comparing this new category to Sears' Best.

Frankly Puzzling

Why there should be a fight at all, why several Tandy execs talk about being on the comeback trail, is certainly puzzling. Since introducing the first mass-marketed micro, the TRS-80 Model I, the Fort Worth, TX, firm has been Apple's greatest competitor in eight-bit computing (the Z80-based Model I lives on in today's Models 4 and 4P).

The Motorola 68000 chip, now playing in Apple's Macintosh, has powered Radio Shack's multi-user Model 16/16B for years; in fact, Microsoft boasts that there are more Model 16s running Xenix than all other Unix systems combined. The Model 100, introduced in the spring of 1983, virtually defined the market for lap-sized portables.

And last November, Tandy rattled the IBM-compatible world with the Model 2000—the fastest, most powerful MS DOS micro you can buy, ahead of newer entries such as the AT&T PC and matched only by other Intel 80186 users like Sunnyvale, CA's Mindset.

Besides, Tandy is Radio Shack, a neighborhood institution comparable to McDonald's—nearly 9000 stores worldwide, enough dedicated Com-

puter Centers to rival ComputerLand as the country's top micro outlet. It's a huge corporation—roughly 32,000 employees, net income of \$298 million on sales of \$2.73 billion for the year ended last March 31. Computers, peripherals and software account for two-fifths of that; by most accounts, Tandy is the third of the Big Three, behind only IBM and Ap-

as familiar as the ads in your Sunday paper, but it rarely comes to mind when people think of hard disks and MS DOS. Tandy's high tech is overlooked, while its Realistic and Archer brands are household words for stereos, soldering irons, tubes, transistors, TV antennas and stuffed toy radios.

This situation is doubly bad for Fort



The old: Radio Shack's TRS-80 Model I, the Z80-based machine that (with the Apple II) started the ready-to-compute industry.

ple (though Hewlett-Packard, Compaq and Kaypro are hoping to catch up). This is a company in need of a comeback?

So Familiar It's Invisible?

Yes, because it's a company with an image problem. Radio Shack may be as near as your corner store and

Worth's computer business. Even those who know TRS-80's reliable reputation, company spokesperson Bruce Elliott says, may forget where to buy them—"If you ask people to name a computer, they'll say Apple, IBM, TRS-80, Atari, Commodore. Now, one of those isn't a company name."

Tandy wants to take the middle ground between Apple and IBM: as much technology as anyone, but technology made usable and affordable.

Beyond brand awareness, there's the stigma Ed Juge, Tandy's director of market planning, describes as "buying a computer you'll bet your business on where your kid buys his CB radio. It's like my wife, who uses all Sears appliances and swears by them but wouldn't be caught dead in a Sears dress."

Besides gnashing their teeth at press articles describing the computer industry as Apple and IBM, Tandy vendors find themselves moving away from a name with a national recognition most companies would die for. Rather than have buyers balk at the connotation of "something that comes from a shack," in Juge's words, last November saw the introduction of the Tandy, not Radio Shack, Model 2000.

The old name isn't dead—after all, it's on 9000 storefront signs—but more Tandy-brand computers seem likely. Says Marketing Vice President Ron Stegall, "We'll work on what we can fix, [the fact] that the guy's talking clock and his CPU have the same name. If it's important that the CPU on your desk doesn't say Radio Shack, okay."

Between Pinstripes and Hot Tubs

Changing brand names is a cosmetic difference; so is changing colors (the entire product line, even printers, turned from gray to white during 1983). The more important change, Juge says, involves conveying "a clearly defined image" or identity.

People see IBM as big, safe and businesslike, while Apple is chic and has the latest technology (sometimes, Juge claims, at the expense of not being fully thought out or workable nor having a ready software base). By contrast, Tandy's image is

rather mundane—battleship-gray computers without much software, advertised on the same page as walkie-talkies.

To change that, Tandy wants to take the middle ground between Apple and IBM: as much technology as anyone, but technology made usable, affordable and connected to a mammoth support network.

It's an image of confidence and reassurance as much as of good hardware, and it's appropriate to an industry Tandy feels is now settling down in terms of smaller differences between companies. "The gee whiz is going to get greater," Stegall says. "All machines are going to be wonderful and they'll all be at the right price."

"The emphasis used to be on hardware; now the software is hot, but newer software's [already] having trouble coming into the market. Having one more [integrated] feature or a faster spreadsheet isn't news; it's like making a faster car versus inventing the car."

Maximum Hand-Holding

This maturing market calls for an approach, Juge says, "almost similar to ads for banks or savings and loans [which compete for customers but offer the same products]. We have to show why you should buy your computer from us."

The answer to that question, according to Stegall, is that Tandy is "a serious business computer store. Give us your problem; we'll execute a solution."

The problem-solving part is just what a good retailer should do: listen to a customer's needs (small business accounting, say) and recommend a hardware and software package to fit. (Stegall expects the

Model 16B to sell despite AT&T micros at ComputerLand—"We're the one storefront retailer that can adequately support Unix"—but, when I visited, Fort Worth was diplomatically dealing with calls from the owner of a one-man tire store who insisted on buying a 16B and was angry that his dealer had suggested a Model 4.)

After the sale, though, Tandy comes into its strength. Says Stegall, "We were doing hands-on training when hands-on training wasn't cool." Echoes Bill Wash, director of computer merchandising services, "We're going to put together the world's best customer service and support network."

Wash's superiors might frown at the "going to"; Radio Shack already spends \$17 million a year on after-sale support, supplying service only the Bigger Two could match but which they reserve mainly for large corporate customers.

Wash's department boasts 220 customer service representatives (forbidden to be involved in sales), training courses for 44 Tandy products and programs and a staff of 65 people to answer phones in Fort Worth, fielding questions on everything from printer interfaces to adventure games. If you ignore all warnings to make back-up copies, trash your only TRS-80 data disk and have no luck trying to fix it, your dealer can send it to a room in Tandy Center where a few technicians, a library of repair utilities and \$150,000 annually are devoted to last-resort rescues.

The 2000: Building Momentum

All the repairmen in the world can't run a computer without software. While not actively discouraging out-

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side software, as Texas Instruments did with the 99/4A, for a long time Tandy didn't look far beyond its house brands.

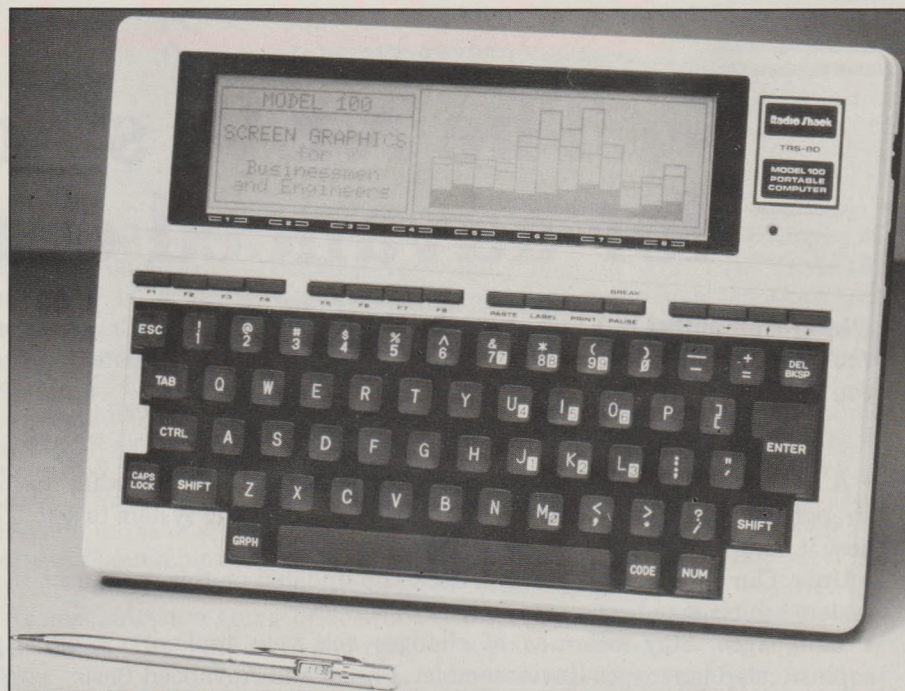
That attitude changed radically when Tandy introduced its MS DOS machine. Model 2000 versions of some programs, like Lotus 1-2-3 and SuperCalc3, sell in Radio Shack stores; you can order others through Tandy's new Express Order Program, in which buyers order third-party software from an in-store catalog and pick it up a few days later.

Unfortunately, the open-door policy was obscured by the 2000's slow start. Tandy's gamble—to make a micro with superior performance instead of just another clone—is sound theory, but at first it was a practical disaster. At the 2000's debut, skyrocketing demand left Intel helpless to supply 80186 chips; Tandy managed to put a 2000 in every Computer Center the day after its Comdex/Fall introduction, but after that it was back orders all the way.

The only thing scarcer than 2000s was software: the machine's quad-density disk drives, with 720KB of storage to the usual 360KB apiece, could read PC data disks but not run programs, and there were only a few plain vanilla programs ready anyway. The 80186 is code-compatible, but most popular IBM software bypasses the slow 8088 and DOS to address PC video directly.

Seven months later, to Tandy's relief, the 2000 has hit its stride. Intel's chip production has caught up with orders. ("We're getting all we can use now," Juge said in late June. "By the end of summer we should be getting all we want.")

As for software, Juge claims, "Major companies have told us we're their second port. They do a version



The new: 1983's TRS-80 Model 100 portable helped revitalize Tandy as a market contender.

for IBM first, which gives them most of the clones, and then they put it on the 2000. Lotus told us it was the easiest [1-2-3] port they've ever done, and [the program] runs two to five times faster.

"Anything that comes out in the IBM world that's not [a tutorial] of how to do something on your IBM, and that looks like a winner, we'll get it," Juge promises. "There'll be no stone unturned. We won't let anyone say we don't have the top software."

"Every one of the top software vendors is doing business with us [now]," declares 2000 product manager Don White. "We see virtually all of the software before it becomes

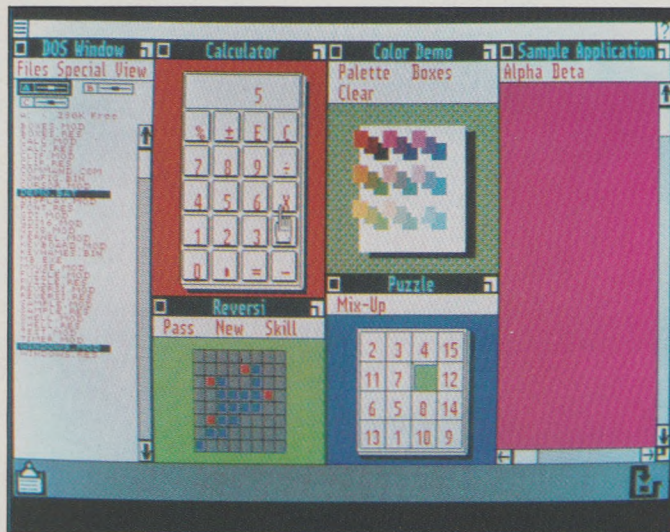
available; we go through lists of best sellers every month. We're not missing anybody."

A Software Showcase

With the initial stumbles behind them, Tandy marketers will talk all day about the 2000—"absolutely technically the most superior MS DOS machine that's out in the marketplace," Stegall brags.

Most of all, they're eager to talk about today's new generation of software—products which, in Juge's words, "are marginal on the PC and good on the 2000."

"One of the stories [Tandy must convey] is that some of the newer stuff, like Ovation, Microsoft Windows



More than Macintosh: Tandy claims the 2000 is "the only machine in the world that can do Windows in color." (Microsoft photo)

and the Lotus kind of software, really does run better on the 2000," White says. "Now that it's available, we have to get the word out."

"You won't be able to run color Windows on a PC, but you will on the 2000. In Microsoft Word, you'll have italics in color. It's the only machine in the world that can do Windows in color, and it's fast—fast enough to do the pop-up menus, redimension the picture in the window."

Van Chandler, Tandy's director of merchandising for business computer products, sums it up: "Lotus is good, but it isn't good enough; Microsoft Word is a fabulous word processor in its own right, but it's a little clunky on the IBM. And Open Access—it's such a dog on the PC, and it smokes on our machine. And the graphics are so lousy on the PC."

"The 2000 makes [software] run like the designers [dreamed] it would run. I don't think there's a better showcase for software. People don't realize. [The 2000] is the ultimate Windows engine; it's for peo-

ple who want one of the top 20 software packages and don't want to wait on the software."

Besides taking on MS DOS rivals, in fact, Tandy is eager to take on the Macintosh. "People are saying the Mac is this new technology and it's all software," Juge says. "There's nothing [there] a PC can't do if it has graphics."

In addition to pop-up menus for Word and Multiplan, White adds, "We have something that's a mouse-driven painting and drawing program in development now. It's a graphics-oriented machine and we'll have graphics software for it." (A Sausalito, CA, developer, Island Graphics Corp., is working with both Tandy and Commodore on MacPaint imitations.)

As for MS Windows itself, the operating system looks dazzling in Tandy demonstrations—a Mac-style directory, calculator and puzzle plus a reversi game, a graphics demo and space for applications, maneuvered in tiles (nonoverlapping windows) on screen in blazing color.

The Microsoft product hasn't exactly sprinted to market (rumored for a year, it's due this fall), and it'll take even longer for vendors to write Windows versions of their applications, but it's clear Apple has no monopoly on mousework. To be fair, a Windows-ready 2000 with expanded memory, mouse and controller board, and hi-res color graphics will cost at least twice as much as a black-and-white Mac.

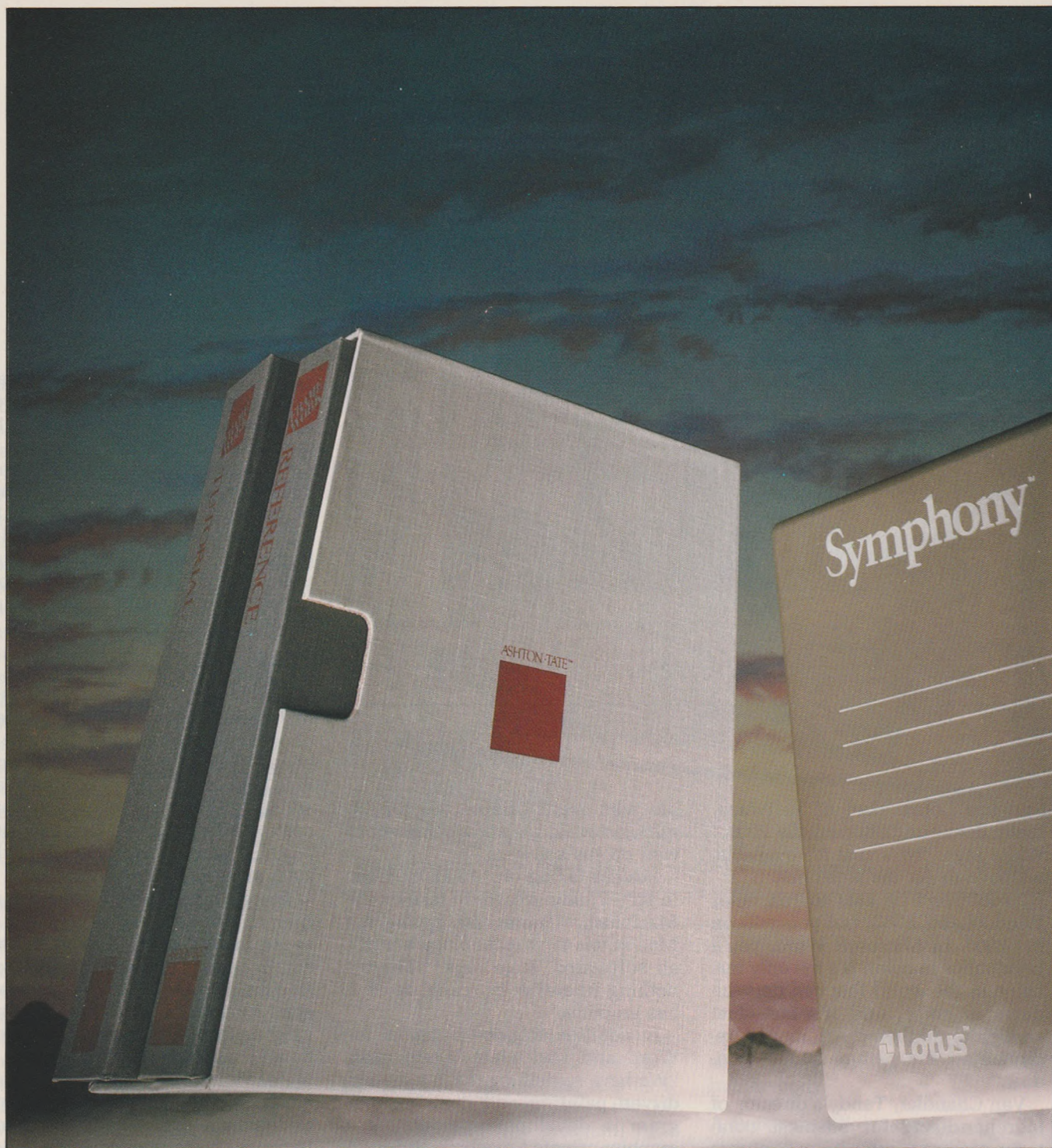
Showing the Flag

There's no doubt the 2000 is a first-rate business computer; there's no doubt Tandy intends to make it better—Chandler hopes for a local area network by the end of the year, adding, "If our strategy is to have cost-effective networking for our business product line, certainly the 2000 must speak Xenix fluently."

There's also no doubt that Tandy intends to be more aggressive in spreading its word. Besides a 2000 commercial that makes fun of Charlie Chaplin, the Fort Worth marketers have launched sales programs ranging from house calls for educational computer sales to road trips to major cities, supplying space and hardware for outside software firms to show off their Tandy programs. Industry gossip expects an upgraded Model 100, and something new in the Model 4 price range, by next spring.

Whether or not Juge is right about computer companies' similarity to banks is debatable, but Tandy feels its superb service network is at least as important as its competitive products. If it can make buyers aware of both—and be comfortable and Middle American without being stodgy—it may fit between IBM's Wall Street and Apple's California after all. ■

Photo by Sharon White/Bob Packert.



Symphony and Framework



Friends or Foes?

By Shawn Bryan

Perhaps you've read about the great shoot-out between Framework from the West and Symphony from the East. This East-West confrontation was described as the beginning of the end for one of the two companies making the products involved, Ashton-Tate (Framework) and Lotus (Symphony).

I was there for the shoot-out and when the smoke cleared, both products were still standing. The shoot-out began when I received my beta copies of Framework. Shortly thereafter, Symphony came to town. Then final copies of Framework arrived, and the duel was on. My job was to chronicle the contest so the rest of the world would know what really happened. Here's my account of the Great Software Shoot-out.

It isn't easy to give you a proper critique of these programs. To keep things straight in everyone's mind, I'll cover Framework first, from beginning to end, and then cover Symphony the same way. I'll draw no conclusions and make no comparisons until the end of the review.

FRAMEWORK

The Framework story has taken on much of the character of an old-fashioned detective story. The program is a marvelous example of what good programmers can do—an exciting program, with the speed, grace and flash of a champion skater. It makes complicated work look effortless.

Search for a Bug

This detective story involves a bug, a bug that I first thought was a software problem but now appears to be a hardware problem. At this writing, the mystery isn't completely cleared up, but here's a quick chronicle of what's happened so far.

Right after I first began using Framework, I started encountering system crashes. The computer would lock up and the only way out was a cold start; I'd turn off the power and wait for it to get through all the memory checking so I could start again. The most dismaying part was that whatever had been on the disk in the file I was using was also gone, dumped out like a child's toys on the floor.

I called Ashton-Tate with the problem. It turned out that antique machines like mine have problems with Framework. The old 8088 chip was the suspect, I was told. I tried the program on a brand new XT—it worked fine. No matter what I did, it wouldn't crash. I can say without reservation that Framework on a new PC works well. I've tried everything I can to break it and I've failed.

That was a relief, but there was still the problem of what to do for all the owners of old PCs. About this time, I got a call from Scott Brown, our tech-

nical contact at Ashton-Tate. He flew to Vermont with new chips to try out my machine, trying to get to the bottom of the problem. With new chips installed, we ran the machine for a few hours and it seemed to work much better.

Premature Optimism

Unfortunately, our optimism was premature, and a new set of problems turned up. The file-save problem cropped up again but much less frequently. In addition, the screen occasionally locked up with what appeared to be snow all over it. A soft reset bailed me out of that problem. Another call to Scott Brown brought a sigh of consternation and a promise of more research.

I began to be suspicious. My machine is an early, early PC with a 64KB motherboard. I had one of the old 1978 Intel 8088s. I began to suspect that there were other old parts in my machine among which might be the culprit. I started hunting around and discovered IBM had quietly released a ROM upgrade for old PCs. While I haven't received it yet, it's on order. For \$40, you receive new ROM chips that bring your old PC up to today's standards and permit you to run a hard disk and to use the LAN IBM is promoting. As soon as I get the new ROMs, I'll let you know what happens.

In the meantime, more research at Ashton-Tate revealed that the problem on old machines might not be the 8088 but incompatibility between the hardware and the Prolock copy-protection scheme. A new production

version of Framework with changes to the copy-protection scheme is already underway.

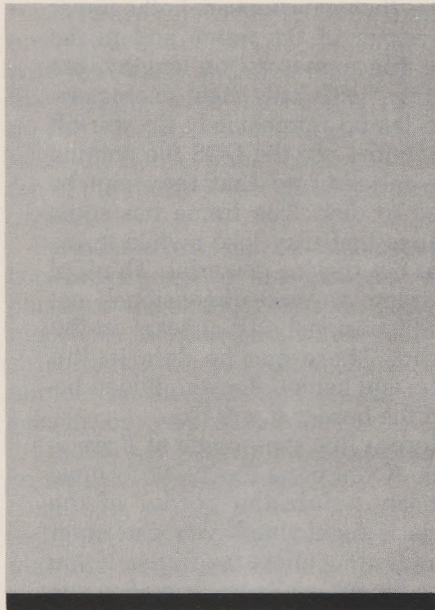
Several things come out of all this. First, Ashton-Tate people are clearly trying hard to solve the problem. I've been assured that they'll make the program right for anyone who has trouble with it. They are working out the hardware/Prolock bug now. They're also still trying to trace the problem in the older machines to make sure they've truly fixed the bug.

While I was originally put off that Ashton-Tate released a product with such a bug, it now appears the bug is isolated to only a few older machines. Also, it seems that it's Vault (the makers of Prolock) and IBM's problem, not a software problem over which Ashton-Tate has control. The program is written to spec; the problem is the old machines are out of spec.

Check Your 8088

The other warning in this is that people with older PCs should consider checking their 8088 to make sure they have a good chip (if it has both a 1978 and a 1981 date, it should be OK), and they should check their ROM date. If it's dated prior to October 19, 1981, you may want to consider upgrading ROMs as well. To check your ROM date, type in this Basic program and run it. The ROM date will be printed on the screen.

```
10 DEF SEG = &HF000
20 FOR X = &HFFF5 to &HFFFF
30 PRINT CHR$(PEEK(X));
40 NEXT
50 END
```

IBM dealers will be able to order replacement ROMs for you. They cost \$40 and can be installed at home. You'll have to turn in your old ROMs because they're proprietary IBM chips.

With that information out of the way, let's look at this marvelous program, pretending for the moment that the bugs aren't there.

The Framework Environment

What is Framework? It's easier to say what it isn't. It isn't a spreadsheet or a word processor or a file manager or an outline processor or a graphics program. It is all of these things and more. Furthermore, it's an environment in which things happen. It's the Fred programming language, which the Fred manual describes as the "glue" that holds the package together. Most of all, Framework is frames, those unique creations that look like windows but aren't.

Frames are Framework's building blocks. A frame actually contains what you see in it. Windows offer you a view into something else, but frames actually contain the data placed in them. Frames can be either saved as separate files or nested, one inside the other, and saved as a single large file. Frames can contain graphs, spreadsheets, data files, documents, even other programs.

When you start Framework, you're presented with an empty desktop. Using the INS key (in Framework, INS is for instruct, not insert—the program is always in insert mode) and the left or right arrow key, you pull

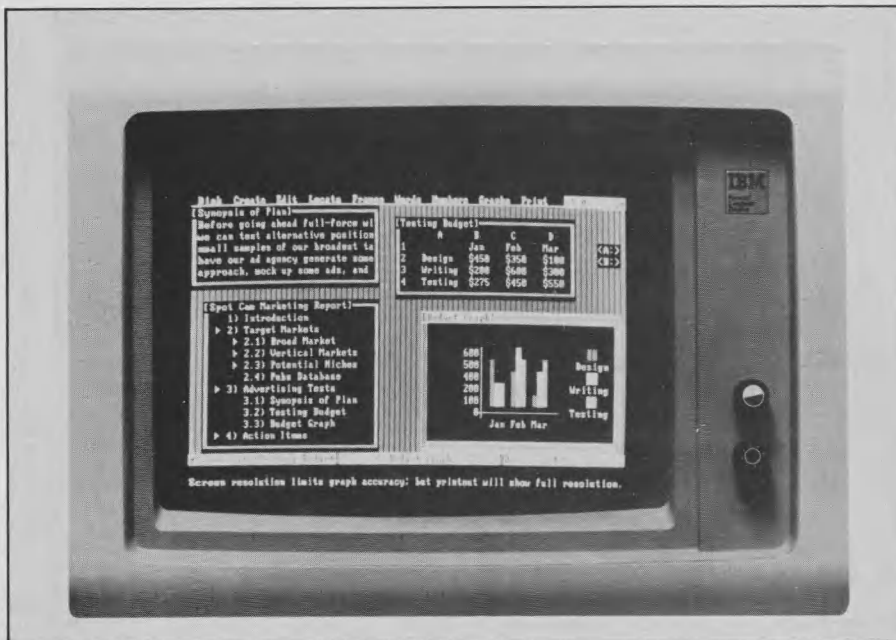


down the Create menu. The CTRL-C key combination does the same thing and is called the fast track selection method.

With the Create menu pulled down, you select what you want to create. The options are spreadsheet, outline, empty word frame or database. No matter which you choose, the results on the screen are the same. You're immediately presented with an appropriate window in which to work. The emphasis is on immediate. Frames appear and disappear instantly. There's no lag while the computer figures out what to do with your commands. The response is 32-bit-like and puts to rest the argument I've so often heard—that fast programs can't be written for the IBM PC.

What else is there? To begin with, there's a series of pull-down menus that offer selections for formatting and manipulating data used by the program elements. The Disk menu contains the filing options you use to save your files to disk. A shortcut that avoids using the menus for saving data works well. Press the CTRL-enter keys and your work is immediately saved. Other options in the disk menu allow you to clean up the desktop with one command, put away documents (save them and remove them from the desktop), save and continue (same as CTRL-enter), write a DOS text file, use the DOS access frame and call communications.

The edit window includes a handy undo selection. Your last entry can be



Framework's screen shows four frames displaying a word processing document, a spreadsheet, a bar graph and an outline frame, which in turn contain a number of other frames.

undone simply by calling the undo command. If you accidentally erase an important letter from the desktop, you can call it back with undo, provided you haven't done some other irreversible act. It gives you a second chance at those errors you wish you hadn't committed.

The Edit menu also allows you to remove rows and columns and lock rows and columns in a spreadsheet, and it turns the protection function on and off. If the protection feature is on, you can't edit a frame. This is also the typeover toggle. Normally, Framework is in the insert mode. If you wish to type over a document, you must first use edit to turn typeover on. Finally, the Edit menu allows you to display hidden characters (like control codes and end of line markers).

The Locate menu offers options for ascending or descending sorts and search and replace. It also permits you to include or exclude formulas, labels or contents from your selection criteria.

The Frames menu permits you to open or close several frames at one time. It also controls the appearance of frames and the border information, and it assists in organizing frames inside a document. The Numbers and Words menus let you style the appearance of these types of material on the screen. Options include highlighting, underlining and italicizing numbers and text. Further, you can display numbers with different formats (like currency) and designate

decimal places. You can also format numbers to appear flush left or flush right.

The Graphs menu leads you through the creation of the possible types of graphs, and the Print menu leads you through printing of documents.

If this brief description of how the frames work piques your curiosity, plan to spend some time tinkering with the frames when you buy Framework. You'll be amply rewarded with what you can do.

Let's Get Framed

Let's examine what actually makes up a frame. A tray appears in the lower right of your screen when a frame appears on the screen. The tray is empty (if you've just created a new frame) but highlighted just like the frame's border, showing that it and the frame on the screen are connected. When you type in a name for this

frame, the name appears in the upper left corner of the frame and in the tray. The name can be lengthy, but the tray holds only eight characters. This should immediately tip you off that frames use the DOS file naming conventions and that they can be saved to disk. The frame has some features that may take awhile to explore but they're powerful. Think of the frame as three-dimensional, not two-dimensional as it appears on the screen. There can be data in the frame and behind it, even hidden behind the border if you like.

Herein lies the power of Framework. If you press the F2, or formula edit key, while the border of the frame is highlighted, you can enter formulas that affect the frame. If you press the F9, or Zoom, key after you press F2, the frame disappears and the entire screen becomes blank. You can now type an entire screenful of formulas. When you're done, you press F9 again and you're returned to the normal view of the frame. The formulas you entered are hidden behind the frame. Describing this is difficult, but offering an example may help.

In Fred, @drawgraph tells the program to draw a graph. You place the type of graph and the location of the data to be graphed, such as the coordinates of cells on a spreadsheet, in the border of an empty @drawgraph frame. Then, when you press the recalculate key, Framework evaluates the function and draws the graph in the frame. This activity is almost transparent because it takes place hidden in the frame's border.

The process of creating the graph can also be menu-driven from the graph section of the Framework program. The graph is drawn by a Fred program created as a result of your menu selections. If you wish to edit the program, you can do so by moving to the border of the frame containing the graph and pressing F2.

Framework uses the plus and minus keys on the numeric keypad to move you in and out of frames. If the border of a frame is highlighted, a press of the plus key takes you into the frame. Once in a frame, you press the minus key to get out to the border again. While you're on the border of a frame, pressing the enter key acts as a toggle, opening the frame up or closing it and putting it into the tray on the desk.

You can have many trays on your desk. The arrow keys move you from

tray to tray. You can open more than one tray at a time and size the frames with the F4 key and drag them about the desktop with the F3 key until they're all visible at one time. Otherwise, the active frame comes to the top of the stack, covering the inactive ones.

Permanent links can be established between frames so that changes in one affect the others. This is especially nice with the graphics and spreadsheet frames, where you can change a number on the sheet and see the results in your graph immediately.

I mentioned earlier that frames can be nested. A good example of this is combining graphs with word processing. If you've created a letter explaining the numbers in a spreadsheet, you can create a containing frame and move the letter, the actual spreadsheet and the graph into the containing frame. You can then print the containing frame and—lo and behold—your letter, spreadsheet and graph will all print in one document. The graph printing is especially nice because merging the graph with the document is seamless with a graphics printer.

That's a brief description of how frames work. It's incomplete, but space dictates that I move on to other parts of this program. If this piques your curiosity, plan to spend some time tinkering with the frames when you buy Framework. You'll be amply rewarded with what you can do.

Now that you've seen the broad categories available when you start working in Framework, let's take a look at each of the program's functional areas.

Outlining

The first Create menu option is outline. If you're familiar with ThinkTank, the outline processor from Living Videotext, Framework's outline processor will seem familiar. If you're not, the principle is simple: create with the computer the same outline you learned to use in high school and college. When the outline window appears, you see a three-section outline; each section has three subsections. You can title each section and subsection just as you would with an outline on paper.

Here the resemblance to a paper outline stops. Moving sections around on paper is a chore and requires redoing the outline. Framework's outline sections can be moved at will with the Move (F7) key. You can also copy the sections of your outline.

Once your paper outline is complete, you can begin writing. You do the same thing here, but you can actually open each of the outline sections and insert the appropriate text into it.

It turns out that the outline sections are really frames organized to look like outlines. Each section is an empty frame that can hold text, a graph, a spreadsheet, a database or another frame. You can even put another outline inside this one if you wish.

The most significant thing about this is that you can brainstorm your speech or paper and put down an outline of what you want to say. Then, without breaking stride, you can begin to enter the text for each section. If you decide to place the opening remarks after your joke, move the outline section "opening remarks" using the move key, and the text inside that frame will move, too. You can quickly fine tune your product and never have to leave Framework. When you have all the data, the graphs, spreadsheet and text the way you want them, you can print it out using the print function. *Voilà!* A speech, ready-made in half the time.

Word Processing

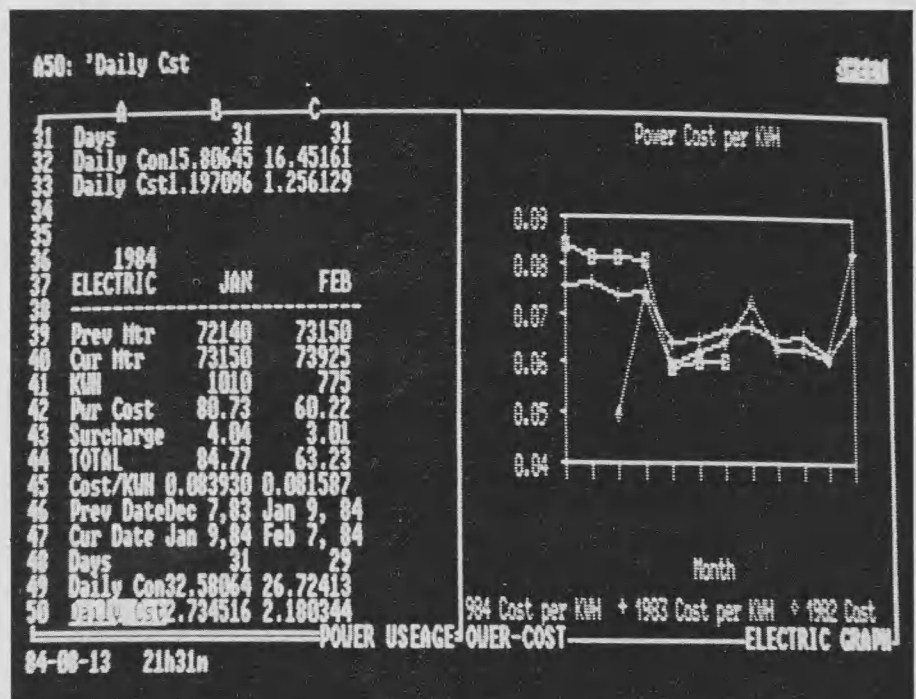
Similar to the outline option is the empty word frame option. When you select the word processing mode, all the normal word processing options are available, plus a few features not found on other word processors. For

example, you can have on-screen italics and underlining on a graphics monitor. That's real underlining, not some reverse-highlighted characters that signal something has been done to them or control codes stuck into the text. Coupled with Fred, every conceivable word processing option is here: centering, left and right justification, various print styles, block moves and copies and so on, a fine imitation of a full-fledged word processor. You can do merges and inserts easily with frames, something windows can't support.

When your document is created, it's spooled to a printer file on disk so you can come back to Framework and work while the document prints. Not only can you create a document quickly, but you can also get back to work quickly.

Framework documents can be as large as RAM allows, but the smartest way to work is to break your document into separate frames for each major thought area. Then you can work on smaller bites at a time, and if you start to run out of RAM, you can put a few sections away on disk to make room for new ones. Later, you can merge the sections together in one containing frame for printing if the entire document fits in RAM. Theoretically, you can nest 32,000 frames inside one frame. Clearly, memory, not software, limits you.

When you work on text, you use a



This Symphony screen shows a window split between a graph and a spreadsheet.

select/action format; that is, you select the text you want to work with first, then you specify what you want to do with it. Using the F6 (Select) key, you highlight the text you want to move, erase, italicize, underline and so on, and then complete the action by calling the appropriate command or pressing the appropriate action key.

For example, to move text, you first highlight what you want to move and press the enter key to lock the highlight on this material. Then you press the Move key and point with the cursor to where you want to place the text. A press of the enter key completes the action.

To speed the highlighting process, the Control key works with the left and right arrow keys to mark words and with the up and down arrow keys to mark lines. End moves to the end of a line, and Control-end moves to the end of a document. PgUp and PgDn move a frame at a time. These key assignments are natural and you fall quickly into a rhythm with Framework. I'd recommend Framework for all but the most demanding word processing chores. It's fast and friendly, and frames add a new dimension to organizing your text.

Spreadsheet

Framework's spreadsheet features are a sophisticated combination of Fred and frame. Each cell in the sheet can contain a Fred command or an entire Fred program. The spreadsheet will look familiar to VisiCalc and 1-2-3 users. It uses alphabetic column markers and numeric row markers.

When you open a spreadsheet frame, the default size of the sheet is a 14 × 14 cell matrix. What this means is that you should plan your spreadsheets in advance. Framework limits the size of the sheet so memory won't be wasted by holding open blank cells. If you have a large spreadsheet, you might be better off breaking it into chunks that use less memory. Generally speaking, you are better off with two or three small sheets than one big one.

Once you've selected the size of your sheet, you're ready to begin data entry. Most of the conventions used by VisiCalc-like sheets are here. You can point to cells with the cursor to include them in some action. You'll have to adjust to Framework's demand that you point straight up to indicate you want to enter pointing mode. I'm so used to taking off in any

direction with 1-2-3 that I often find myself doing the same with Framework. Unfortunately, if you start going in some other direction, Framework won't understand that you want to use the pointing method to select cells.

Framework has several nice features that I don't find in my other favorite spreadsheets, making up for the somewhat awkward pointing convention. You can use the numeric keypad to enter data because a double press of the enter key automatically moves the cursor down one cell. You can avoid having to shift back and forth between cursor and numeric control.

Framework also has two methods of cell referencing. The first is the usual grid coordinate system where

Framework sets new standards for programmers and for human interface. It's so hard to describe because there's nothing to compare it to. Framework should be found in offices where people have to work with thoughts and ideas.

the cell is named by its column and row identifiers. By pressing the exclamation key (!), you can move to a text referencing method of cell identification. If your data has row and column headings, each cell is addressed by its actual characteristics. For example, a cell can be called FY84.Salaries after the column and row identifiers. If you're working on a consolidation sheet, you can get FY84.Salaries from the subsidiary sheet by name without having to remember the grid coordinates. This also makes it easy for an inexperienced spreadsheet user to see the underlying logic.

Various styling and formatting options are available to pretty up your spreadsheets, and the same print menu that's used to print your outline and letter is used to print your spreadsheet.

Graphing

Graph selection in Framework is somewhat limited but it has excellent resolution and speed. You can draw bar, stacked bar, pie, marked point and line graphs. You can overlay two graphs with some limits. A bar graph can be overlaid with a marked point or line graph. Pie charts cannot be overlaid. Medium-resolution charts in full color are available at a press of the F9 (Zoom) key. The default is high-resolution black and white. Most graphing situations can be handled with Framework, and plotters and graphics printers are well-supported.

A nice feature of the graphics function is that the program automatically picks up titles from the columns or rows you're working with and keys your graph accordingly. This feature can be turned off or modified since it's done by Fred, but it saves typing the legend into the graph if your spreadsheet titles are descriptive enough.

Fred draws all graphs, so the full power of that language is at your disposal and almost unlimited customizing of your graphs is possible. I found the graphics part of Framework to be a real pleasure. Data for graphs can be taken from a spreadsheet or a database. The way frames enable information swapping makes graphs as natural to do as any other type of work in Framework.

Database Management

The last function provided in Framework, the database function, works much like a spreadsheet—the database frame appears as a space followed by a double line and then more space. Column headings and row numbers aren't shown, but you feel as if they're there. You enter the field names above the double line and the data below it.

This file manager won't replace the regular database management program you already use (or threaten dBase II or III's revenue base), but it does make a quick and handy address book or telephone number reference. It works quickly because everything has to be in RAM. It also sets up easily because of the column and row format. Field length is set by using the Size (F4) key to expand or shrink the size of the field.

Once data is in the file, you can search for an occurrence of the data you want, you can sort the data or you can filter it to select only records meeting a certain criteria. If you wish

to view the data in a different format, press the F10 key (View). The data appears with each field in a separate frame on the screen. In the form view, you see only one record on the screen at a time. In table view, you see all the records that will fit on the screen at once.

The nice thing about the form view is that you can drag the forms around the screen to create a custom data entry or data retrieval form. This customized form can resemble the paper forms you work with, making the transition to a data manager easier. You can reshape each field to create novel data screens. I had a great deal of fun playing with this. It appeals to my creative nature to be able to stretch and squeeze data fields like so much silly putty.

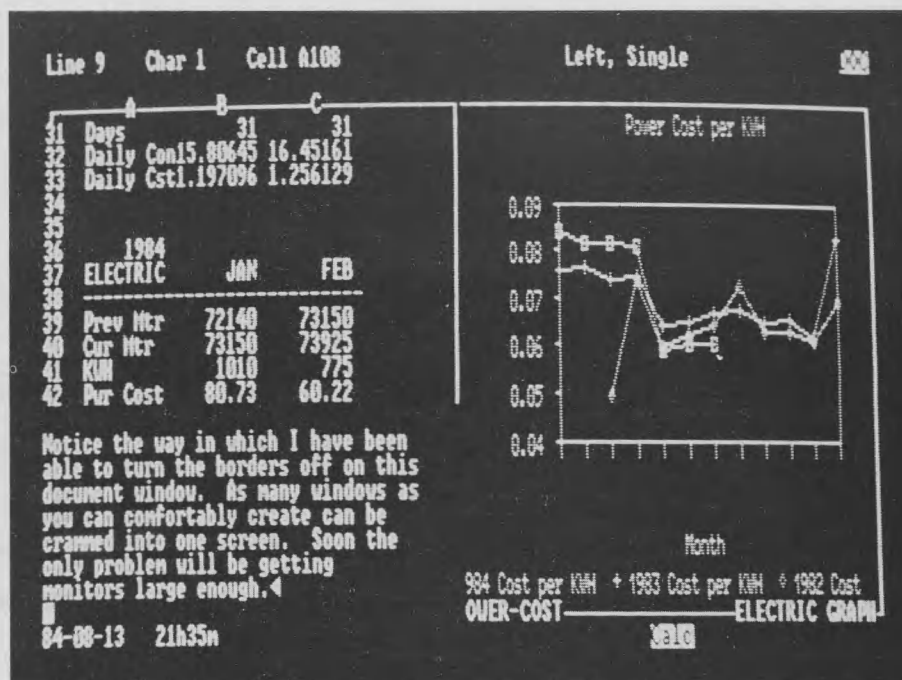
When it comes time to print your data, what you've designed on the screen is also what you'll see on paper. It might take a little tinkering, but getting Framework to print on pre-printed forms would be possible. The only limits on the database are memory limits. A large file just won't fit. I couldn't quite get a six field by 600 record file to fit in a 640KB machine.

Communications

Framework's telecommunications feature isn't actually a part of Framework, but works through it. To be competitive with other communications-equipped programs, Ashton-Tate bought the rights to distribute Mite, a communications program sold by Mycroft Labs. Mite is a separate program that Framework has been configured to include through a DOS window. It can do binary or asynchronous file transfers and comes with a complete tutorial and explanation section that rivals the best I've seen for beginners.

The real story is not Mite, however, but the integration of Mite into Framework. It was done at the last minute and is both testimony to, and an example of, the power of Fred. It runs through a DOS window and permits the capture of transmission of Framework files directly. I won't cover Mite further, but I recommend you study the way in which Mite was integrated using Fred. It's a good sample for you to follow if you wish to integrate other programs into Framework.

That briefly introduces you to Framework's features and functions. Space allows only the highlights; there's much more to Framework. For example, Ashton-Tate sells a sep-



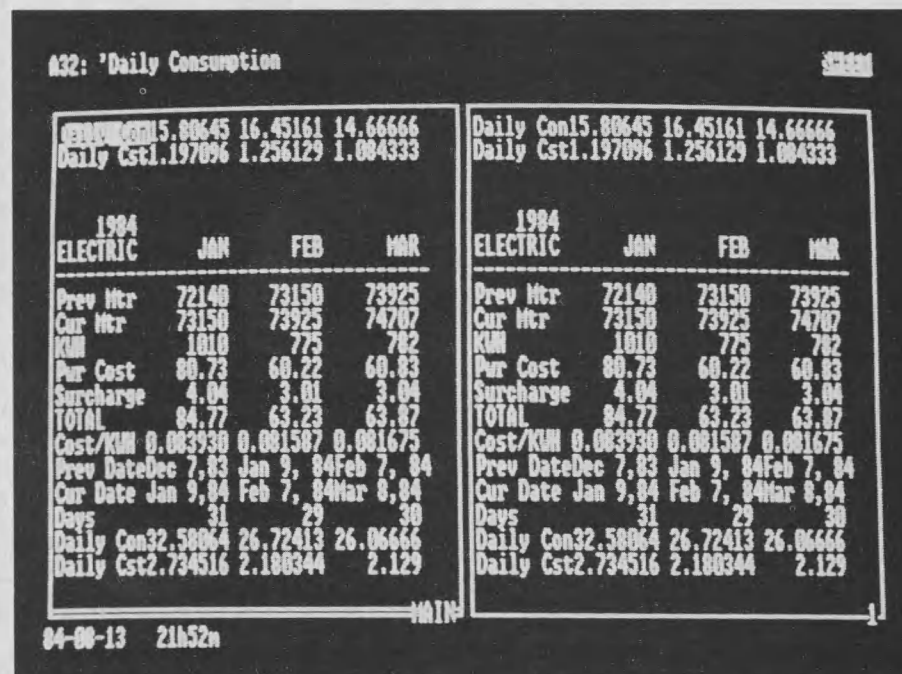
The split window of the previous screen shot is reproduced with text added in a third window.

arate reference work for people wanting to program in Fred. If you're interested in Fred, I recommend this book.

Framing the Conclusion

Framework sets new standards for programmers and for the human interface. It's so hard to describe because there's nothing to compare it to. Framework should be found in offices where people have to work with thoughts and ideas. It isn't primarily

a spreadsheet—spreadsheets still handle spreadsheet activities with more grace than Framework. But no spreadsheet works with words the way Framework does. Framework can translate spreadsheet and dBase II files into its syntax so it can actually reach beyond its own limits to capitalize on the strengths of other programs where necessary. Framework is a winner in every sense of the word.



This is an example of the Symphony Window Pane command. The screen can be divided into an unlimited number of panes.

SYMPHONY

If Framework is the ultimate idea processor, then Symphony is the ultimate number processor. Where Framework is a generalist, Symphony is a specialist. I see Symphony and Framework living and working side by side in peace and harmony, with Framework handling the conceptual work and Symphony cranking out the numbers. Since Symphony is a spreadsheet, it's ideal for numbers. People who use ledger sheets and spreadsheet programs will be immediately comfortable with Symphony. It's hard to tell 1-2-3 from Symphony when you're in Symphony's sheet mode; the command structure is quite similar.

Symphony is a complex program. It has the same features as Framework, except for the outline processor, but implements them in entirely different fashion. Its macro facility corresponds to Fred in Framework—not as versatile or sophisticated as Fred in a programming sense, but it handles numbers on a spreadsheet better than Fred. Before I launch into comparisons, I want to look at Symphony alone.

Symphony's primary and default start-up mode is the sheet mode. This is a spreadsheet, which looks a lot like 1-2-3 except that it sits inside a window frame on the monitor. All the attributes available to a 1-2-3 user are available to the Symphony user, plus a few more. Monochrome and color monitors are supported at the same time, if you want, with graphs going to the color monitor and text going to the monochrome. If you have a high-resolution color card, you

can use it to do graphics and text at the same time on the screen; otherwise, you'll be limited to text or graphs in color, or multiple text and graph windows in monochrome.

Once you have your configuration set and have started Symphony, you are ready to use the spreadsheet. Symphony has strengthened the spreadsheet mode in several ways. First, string handling is improved. String statements can be used in formulas, for example, where 1-2-3 permits only numeric data. A good example of how this is useful is building a sheet that uses the @If function. If you wish to enter a number in a table, say a daily revenue sheet, and have other percentages calculated automatically, you can do so. In 1-2-3 you'd have columns of zeros where the data wasn't yet available. Symphony accepts a null (empty) string, leaving your sheet blank except where data is actually entered. It looks like this:

```
@IF((A1>0),((B1-C1)/C1),(""))
```

This formula looks at daily revenue in cell A1. If there's an entry, the first formula is executed, comparing, for example, cumulative revenue to date this year with last year as a percentage. If A1 is not greater than 0, the second formula is executed, which puts "", or an empty string, into the designated cell.

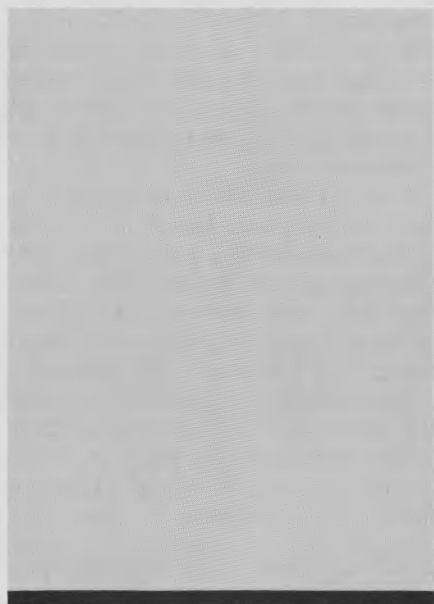
In 1-2-3 the second formula had to include a numeric argument, e.g., 0, and your sheet was filled with zeros instead of empty space. It makes a much less distracting presentation to see just the data you need.

Other nice changes are settings and configuration windows. Now you can see at a glance how you've configured your spreadsheet. The windows show the options, such as protection, format, recalculation and so on. If you want to know if the sheet has punctuation turned on or if the format is currency, you look at the settings window. You no longer have to go to the specific item and set it to be sure it's enabled.

The macro facility now has a learn mode. Where you used to have to type macros into 1-2-3, Symphony types them for you as you go through the motions. Just tell Symphony to learn your keystrokes and they're saved to a range of cells you select just as if you typed them yourself. If you never used the 1-2-3 macro facility because it was too hard to learn, this one will encourage you to use it all the time. You can go into the macro and edit it, if you need to later on, because it's saved just like a 1-2-3 macro—in cells on a spreadsheet.

Ranges are also improved in Symphony. You can now transpose a range, that is, convert a column to a row or a row to a column. There's also a range Fill command that makes it easy to create a table of evenly spaced values. You're asked for a start value and a step value, and Symphony fills the range, starting with the start value and incrementing each subsequent entry by the step value.

Range distribution is also new. This function calculates how many numbers in the range selected fall within specified values; that is, it produces a type of frequency distribution table.



Probably the most interesting new range command is the range What-if command. Using the What-if command, you can create a table of values as output in response to a table of input values. Symphony will read your table of input values and perform the specified calculations (e.g., vary the interest rate on a loan to see the impact on loan payments).

Symphony has added a new dimension to this old trick by allowing you to specify two input, or what-if, ranges. A two-way what-if table must be constructed so that the master formula is at the upper left of the input ranges. Symphony will calculate output values based upon the two variables and place them in the table range you've designated. This automates a process most of us have done many times by hand or with macros.

These are a few of the changes in the Symphony sheet. Perhaps the most striking change in Symphony, when compared to 1-2-3, is the window facility. Symphony lets you create windows that look at different parts of the spreadsheet. More important, the windows can have specific attributes that make them appear to be more than windows onto a spreadsheet. As you know, Symphony includes word processing, graphics, database management and telecommunications in the spreadsheet. The windows give you access to different parts of the sheet at the same time, but they also give you access to different parts of the sheet in different ways. The document window takes the designated section of the spreadsheet, removes the row and



column labels, adds a document format line and document handling commands and lets you go on your merry way as if you were in a word processor. The only time this illusion is broken is when you switch from the document window to the spreadsheet window and discover that what you've typed is stuck into a column as label entries. Then it's suddenly clear that this is still a spreadsheet, not a word processor.

The real point is that the spreadsheet is transparent while you're in a document window. You can move text, delete it, center it, add print attributes to it and generally treat it just as you would with your regular word processor program.

You only need to be wary about a few things. First, remember you're in the spreadsheet. When you type material into the document, it's being put into cells in a spreadsheet. If you don't restrict yourself to an area of the sheet where there's no other ma-

terial, you can type right over your spreadsheet. When you return to the sheet, you'll find a column of left-aligned labels stuck through the middle of your profit statement.

Second, remember that all the text you enter is in memory, just like your spreadsheet. It's wise to save regularly and to remember the memory limits of your machine. Symphony is a large program, and you can easily run out of memory if you get carried away with your spreadsheet.

You can combine data from your spreadsheet with a document. This is most easily done by returning to the sheet mode and copying the information from the sheet into the document. Then return to the document window and continue to edit your material. Formulas in the cells you copied remain active but do not automatically recalculate. You must press the manual Recalculate key to force recalculation while you're in the document window. You aren't

able to edit sheet entries in a document window, either. If the cells are too big to fit in the window, you have to change the underlying sheet column width to squeeze them in. The fact that all the data is in the spreadsheet does make swapping back and forth convenient.

Your document is printed in the same manner as a spreadsheet. You designate the range to print and the margins you wish to include in the printer setup menu. The print menu is always available with the F9 (Command or Services Menu) key. I've used the text processing feature of Symphony extensively and it works well. People accustomed to 1-2-3 will be comfortable in a day or two with this feature. Once you get over the hurdle of associating what looks like a perfectly normal word processing screen with the cells in a spreadsheet, you're on your way to word processing proficiency.

Graphing

As with 1-2-3, there is a graphics package in Symphony. It works much the same way the 1-2-3 program does in one respect: you must exit Symphony and go to Printgraph if you want to plot your data on paper. This is a real pain in the neck, especially since getting back into Symphony requires that you place the system disk back into the computer so you can boot the spreadsheet program again. Otherwise, I have no complaints about the graphics.

The real improvement is that you can assign graphics commands to graphics windows and view several graphs of the same data in rapid succession. You can also have a high-resolution window with a graph on the screen at the same time that you're working on the spreadsheet. You can instantly see how the numbers change. Remember, it's high-resolution monochrome. If you have a color monitor, you can view either color graphs in medium-resolution or the spreadsheet, but not the two together. If you have a high-resolution color card or a monochrome monitor and a color terminal, you can have the best of both worlds. It may well be worth the several hundred dollars to upgrade to a Plantronics-type card just to be able to have the color graphs and text at the same time. The display loses a lot in black and white.

The Symphony program has added one new type of graph that's not in the old 1-2-3 section. You may now

plot high-low-close graphs, a boon to all you stock watchers. Other changes that improve the graphics include the ability to turn off the scaling feature and graph menu windows. The menu windows show you at a glance what features have been selected for each graph. There are two windows that you must switch between to see all the possible settings, but it's a far better system than the old method where you had to check each item to see how it was set.

There are few other changes in the graphics program. The most beneficial change is the windowing feature that allows you to page through a number of graphs instantly or display graphs and text at the same time.

As with 1-2-3, there is a graphics package in Symphony. It works much the same way the 1-2-3 program does in one respect: you must exit Symphony and go to Printgraph if you want to plot your data on paper. This is a real pain in the neck.

Unfortunately, the graphs aren't as seamlessly integrated here as they are in Framework. Sticking a graph into the middle of a letter would be tedious since you'd have to leave space for the graph in the text, print the text and then plot the graph in the hole.

Database Management

Database management takes the prize for being most improved in Symphony. While it still isn't a database management program, the manner in which Symphony has dealt with databases is much more elegant than the old 1-2-3 abomination. The sheet database management functions are still much like the old 1-2-3. When you create a form window, however, all the confusing terminology disappears and a database entry form is the ultimate result of your efforts. The spreadsheet operations are

transparent, as they are in the document window. The easiest way to understand how the database system works is to go through the creation of a simple file. I'll use names and telephone numbers.

First, type the names of the fields in your database into the columns on the spreadsheet. In this case, I have two columns, labeled "Name" and "Number." Make sure that you have plenty of room below the titles for the information you'll enter into the database.

Now, create a form window. Go to the services menu, select Window Create and then select Form from the menu of window types. Quit the menu and Symphony immediately displays the error message "no definition range defined." Use the F10 key to select the form menu and select the Generate command. Symphony then prompts for the type of information you'll enter into the database.

The default types of data are labels, numbers, dates, times or computed fields. In this case, I'll select the label field since I'm treating the telephone numbers as labels, not as values to be calculated or manipulated. The next prompt asks for the field length. Enter a field length long enough to accommodate the longest entry you anticipate putting into the database.

Finally, Symphony asks you to name the database. Symphony now returns you to the form window and prompts you to highlight the range of field names. Using the cursor keys, highlight the name and number labels on the sheet. When you press the enter key, Symphony creates a database entry form in the form window using the name and number column headings as prompts for the fields in the database.

The form created in this manner looks much like the data entry form used in most other databases. The nice thing is that Symphony permits you to edit the location of the fields on the form and to enter special information, such as comments or footnotes, to the screen to customize the form. The data entry process is simply a matter of filling in the blanks on the form and pressing the page up, page down, home or end key. If you swap windows at this stage and look at the sheet underneath the form window, you see the two columns labeled just as they were and below that, the data entry algorithms that tell Symphony where to put the information in the columns.

Time to Recalculate a Spreadsheet

Framework	45.61 seconds
Lotus 1-2-3	4.12 seconds
Symphony	4.82 seconds

Table 1. Speed comparison. The spreadsheet consisted of 26 columns and 50 rows where each cell was dependent upon the cell to its upper left for a value. Average recalc time is for three separate recalculations.

Getting data back out of the database is done in several ways. First, and perhaps easiest, is through the data entry form. Simply page through your database one record at a time, using the page up and page down keys, until you find the information you seek. As you move through the database, each record appears in the form window.

Like 1-2-3, Symphony supports the sorting of data and the extraction of data from the large file into smaller files based upon selection criteria. These operations are similar to those used in 1-2-3. Because all of the records are maintained in memory, operations are generally fast, but you must keep memory limitations in mind so you don't exceed the space available. Symphony can be used to keep small files of often used data, but it shouldn't be considered a substitute for a full-fledged database management system.

Information from the database can be incorporated into spreadsheet windows and document windows. Data can also be extracted from the database and used in a graph window. The Lotus documentation does an admirable job of explaining how to accomplish these tasks.

Communications

The new entry to the old Lotus is the communications function provided by Symphony. This is also the weakest part of Symphony for several reasons. First, Symphony supports only two modem types for automatic operation, the Popcom and Hayes. Second, the setting up of communications files and capture of telecommunications data into cells in the

spreadsheet is more confusing than any other section of the program. This isn't entirely unexpected, however, because communications is a complicated subject that normally causes problems, even for dedicated communications programs.

To set Symphony up for communications, you first select a comm window. You're presented with the initial communication setting sheet. On this sheet, you set up the interface (bit rate, parity, data length and stop bits), phone type, terminal defaults, handshaking and capture information. If you're using an automatic modem, you can use Symphony to dial the telephone, capture data and hang up automatically. You can also place Symphony into an auto-answer mode to receive data unattended.

These activities are controlled by the log-in command menu. It's in this section of the comm window that you specify log-in strings and other protocols that are used to tell the other system what you want to do after you've acquired the telephone line.

There are two ways to receive and send data with Symphony. The file-transfer Receive and Send commands use the Xmodem protocol to send and receive files. If the system you're communicating with doesn't use Xmodem, you have to use the transmit range and settings capture commands to send and receive data. When you send data in the latter mode, text lines transmit one at a time, not as cell entries. No error checking is supported in this mode. In the Xmodem mode, file transmission is checked and messages appear showing the number of bits received and the number of errors detected.

Unless you specify to Symphony that you want to capture data, the program simply displays what is received in the comm window. To save data, you must specify a method of reception and a range into which the data is to be placed. Make sure you set the column widths wide enough and the number of rows deep enough to capture all the data or you'll lose data received after the range is filled. While you're receiving data, you can toggle the save mechanism off and on to save only data important to you. Once you've received data, you can edit it for import to a document or a spreadsheet.

These, in a nutshell, are the highlights of Symphony. The bottom line for me is that Symphony is a powerful and well-constructed spreadsheet. It has features that no other spreadsheet can provide. Table 2 shows the difference between Symphony and 1-2-3 in this respect. Symphony has added many new functions and changed some old ones.

My first reaction to Symphony could have been negative. Its screen response time and recalc times are a little slower than 1-2-3. There's so much more to it that, at first glance, it seems as if it will be much more difficult to learn. If you have no spreadsheet background, Symphony is difficult to grasp. I wouldn't want to start off with Symphony and have to be productive in a few hours—there's just too much to it.

At the same time, Symphony is easier to use for the experienced spreadsheet user than 1-2-3. The bugaboos—macros, for example—are fixed in Symphony. Anyone should be able to create a macro with little effort. The

screens are more informative in most cases in Symphony. The program comes together smoothly and I like it.

Which One?

Back to Framework and Symphony. The table of functions compares Fred with the functions in Symphony since Fred is function-oriented. That's a basic comparison. What other similarities are there? Both programs are memory hungry. Each cries out for a hard disk, but, more importantly, each cries out for a copy-protection scheme that permits transfer of the program to a fixed disk.

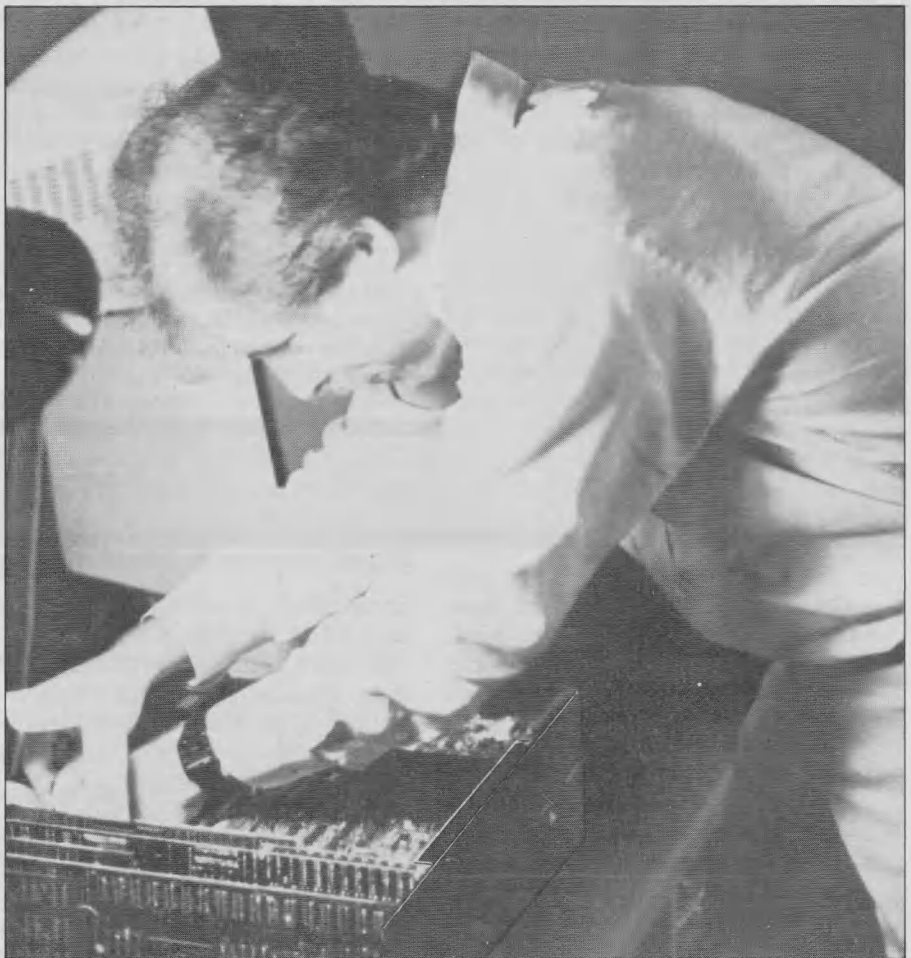
One thing missing from both programs is virtual memory. On a 640KB machine, Symphony has 348.7KB of workspace. Framework has a little more (387.6KB). Both programs, to work well, have to keep the stuff you're working on in memory. The result is a memory constraint that can quickly become debilitating.

The fix for this is virtual storage, which uses disk storage for files being worked on. With proper caching techniques, the performance of these programs would not be significantly degraded and the useful memory size would be extended to the size of the disk. In the case of a 10MB hard disk, this would provide some real advantages.

How will these programs compete with one another? In my opinion, the competition has been overplayed. There will be a friendly coexistence between the two. This is as it should be. Symphony is still better with numbers and spreadsheets than anything else available. It's the ideal spreadsheeter's package. Financial types, accountants and others dealing in detailed numbers analysis and modeling will be comfortable with Symphony.

In the same office, Framework will appeal to the generalist: the corporate executive, the public relations people, the speech writers, the "thought manipulators." Framework is a tool for the rest of the people who don't deal in the details of the numbers, but who take those details and turn them into corporate statements and policy memoranda and SEC reports.

I will say that both Lotus and Ashton-Tate should concentrate on making their programs conversant with one another with a direct file transfer mechanism that allows Framework to read the Symphony WRK files and Symphony to read Framework FW



Ashton-Tate's Scott Brown flew to Vermont to help Microcomputing author Shawn Bryan locate a bug that is encountered when users run Framework on older PCs.

What Price Integration?

One of the questions you should ask is what price you pay for all this integration and performance. The most important aspect beyond actual cost in dollars is memory. I don't recommend either of these programs unless you plan on at least 512KB of memory. I recommend 640KB, the maximum your IBM PC will hold, if you plan on serious work. Let me give you some comparisons.

With 1-2-3 on a 640KB machine, you have 532.4KB available for data after you've loaded 1-2-3. On the same machine, you have 348.7KB left with Symphony and 387.6KB left with Framework.

What does this mean? On Framework, you can build a spreadsheet no larger than 26 columns by 70

rows. In Symphony you're limited to a spreadsheet of 26×278 . The same machine creates a 1-2-3 spreadsheet more than 26×550 . A database in Framework can be no larger than about five fields by 950 records.

The point is this: These programs need memory, lots of memory, to be efficient and useful. The more applications they're used for, the more these programs chew up RAM. A letter, graphs and spreadsheet can tax the limits of both these programs with anything less than the maximum RAM. So do yourself and your program a favor, and load up on memory. It's inexpensive compared with the price of the program.

S.B.

files. These programs will be used together, and such a mechanism will only enhance the usefulness of both programs. It's inevitable that someone will find a way to do this. Certainly Fred is capable of doing it, since Ashton-Tate includes a DIF conversion program on the utilities disk. I'm sure Symphony can reciprocate.

The shoot-out never occurred. I was there and watched and saw the two contestants meet in the middle of the street and turn and go their separate ways without firing a shot. The smoke was caused by the press, who thought there was going to be a fight

and started reporting it before it began.

Certainly there will be some tension between the two, just as there always is when two great people occupy the same space. But the benefit of having two such noble contestants meet and discover they have no differences is that they raise the level of professionalism for everyone.

The availability of two such well-designed programs will redefine what is considered a good buy. Framework or Symphony at \$695 is a much better buy than the two or three or four programs they replace, simply because they tie together the programs and

the support so necessary to permanence in the software industry.

Ashton-Tate and Lotus are both serious companies that support what they sell. At press time, Framework is running perfectly on my PC since I've had my new ROM installed. Lotus and Ashton-Tate both have reputations for supporting their products well. I recommend these new products to you with enthusiasm. ■

Address correspondence to Shawn Bryan, Datatek, Montpelier Junction, Box 4500, Montpelier, VT 05602.

1-2-3

ABS	CHOOSE	DCOUNT	ERR	INT	MAX	PI	SQRT	VAR
ACOS	COS	DMAX	EXP	IRR	MIN	PMT	STD	VLOOKUP
ASIN	COUNT	DMIN	FALSE	ISERR	MOD	PV	SUM	YEAR
ATAN	DATE	DSTD	FV	ISNA	MONTH	RAND	TAN	
ATAN2	DAVG	DSUM	HLOOKUP	LN	NA	ROUND	TODAY	
AVG	DAY	DVAR	IF	LOG	NPV	SIN	TRUE	

Symphony

ABS	CLEAN	DMAX	HLOOKUP	LEFT	MONTH	REPEAT	SUM
ACOS	CODE	DMIN	HOURL	LENGTH	N	REPLACE	TAN
ASIN	COLS	DSTD	IF	LN	NA	RIGHT	TIME
ATAN	COS	DSUM	INDEX	LOG	NOW	ROUND	TIMEVALUE
ATAN2	COUNT	DVAR	INT	LOWER	NPV	ROWS	TRIM
AVG	DATE	ERR	IRR	MAX	PI	S	TRUE
CELL	DATEVALUE	EXP	ISERR	MID	PMT	SECOND	UPPER
CELLPOINTER	DAVG	FALSE	ISNA	MIN	PROPER	SQRT	VALUE
CHAR	DAY	FIND	ISNUMBER	MINUTE	PV	STD	VAR
CHOOSE	DCOUNT	FV	ISSTRING	MOD	RAND	STRING	VLOOKUP
							YEAR

Framework

ABS	DATE2	FLOOR	IRR	MAX	PMT	SCIENTIFIC	TEXTSELECTION
ACOS	DATE3	FP	ISABEND	MEMAVAIL	PN	SELECT	THOUSANDS
AND	DATE4	FR	ISALPHA	MENU	PO	SET	TIME1
ASIN	DATETIME	FV	ISERR	MID	POUND	SETDIRECTORY	TIME2
ATAN	DBASEFILTER	GET	ISNA	MILLI	PR	SETDRIVE	TIME3
ATAN2	DECIMAL	GETENV	ISNUMERIC	MIN	PRINT	SETFORMULA	TM
AVG	DIFFDATE	GETFORMULA	ITEM	MIRR	PRINTRETURN	SETMACRO	TODAY
BEEP	DISPLAY	HC	ITEMCOUNT	MOD	PROMPT	SETSELECTION	TRACE
BM	DOLLAR	HF	KEY	NATIONALIZE	PUT	SIGN	UNHIDE
BUSINESS	DRAW	HIDE	KEYFILTER	NEXT	PV	SIN	UNIT
CEILING	DRAWGRAPH	HL	KEYNAME	NEXTKEY	QUITMENU	SK	USER REFERENCE
CHOOSE	ECHO	HLOOKUP	KP	NOT	RAND	SP	VALUE
CHR	ERASEPROMPT	HP	LEN	NP	REPT	SQRT	VAR
COS	EXECUTE	HR	LIST	NPV	RESET	ST	VLOOKUP
COUNT	EXP	IF	LL	OR	RESULT	STD	WHILE
CURRENCY	FC	INPUTLINE	LN	PERFORMKEYS	RETURN	SUM	WRITEFRAMEFILE
DATE	FILL	INT	LOCAL	PI	ROUND	SUMDATE	WRITETEXTFILE
DATE1	FL	INTEGER	LOG	PL	RUN	TAN	YEN

Table 2. While a direct comparison of functions isn't necessarily a good measure of program power, it can be an indicator. Here, side by side, are the functions of 1-2-3, Symphony and Framework. Framework wins hands down on numbers, but remember, these are Fred functions and Fred is a programming language in its own right. Many of the Framework functions are devoted to program management issues that you wouldn't have with Symphony.

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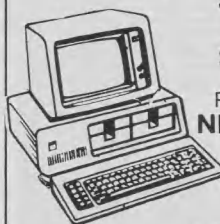
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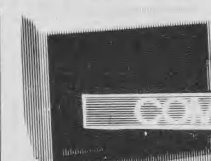
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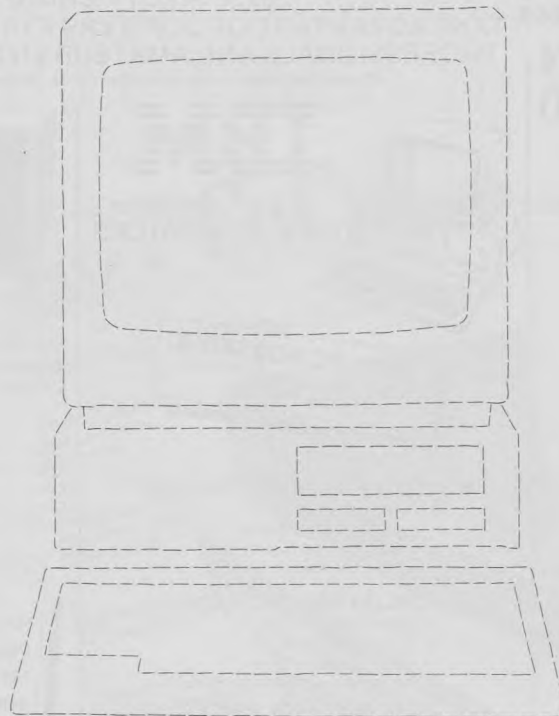
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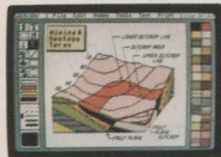
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Capacity: 360KB	Resolution: 4-color: 640h x 200v
Processor	16-color: 320h x 200v
16-bit 8088	Expandability
Keyboard	Open architecture
Typewriter-style	Optional 128KB Memory Expansion Attachment(s)
Detached; cordless	13 ports for add-ons, including built-in serial interface
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Managing Your Money™ by Andrew Tobias, new on cartridge for PCjr, is a comprehensive personal financial advisor and manager.



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OPEN ACCESS

An Integrated Bundle of Joy

Will Open Access make you forget Symphony or Framework? This complex and powerful package features six integrated modules and high-resolution color graphics. Open Access's windows are worth looking into.

By Charles R. Perelman

Open Access has plenty of features—six integrated modules, windows galore, high-resolution color graphics—and on top of all that, it's fun. This versatile and powerful example of integrated software is a complete interactive data-sharing system that consists of an average word processor, powerful spreadsheet and database management modules, exciting interactive graphics, a handy appointment calendar and basic communications ability.

To take full advantage of Open Access, you need a PC DOS or MS DOS 2.0 system, 192KB RAM minimum, two double-density floppy drives (or one floppy and one hard disk), high-resolution graphics, a color monitor, modem and dot-addressable printer.

Out of the package, the program

works with dual floppy drives and a monochrome monitor. I reviewed the Tandy 2000 version of Open Access utilizing that machine's quad-density floppy drive (96 tracks per inch) and a hard disk. All six modules fit on one quad-density unprotected disk. (The modules require two disks for computers with 48 tpi drives.)

Getting Around

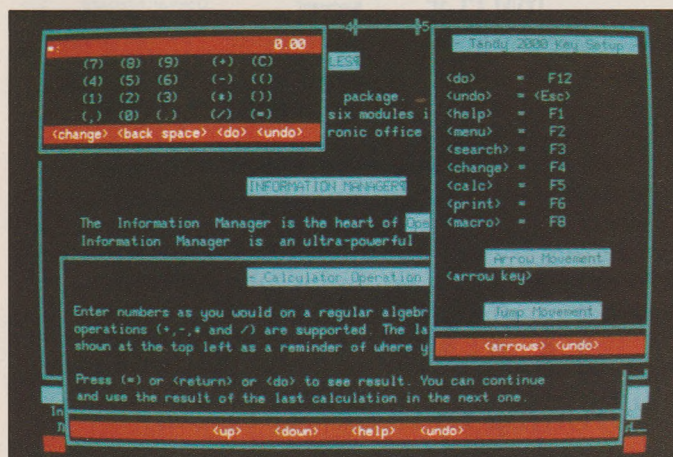
You use menus to move from one module to another and to choose options within a module. You either highlight a choice with the cursor and execute it with the Do function key (F12 on the Tandy) or type the first few alphabetic characters of the command—a nice time-saving touch a la Lotus 1-2-3.

If you like special purpose keys,

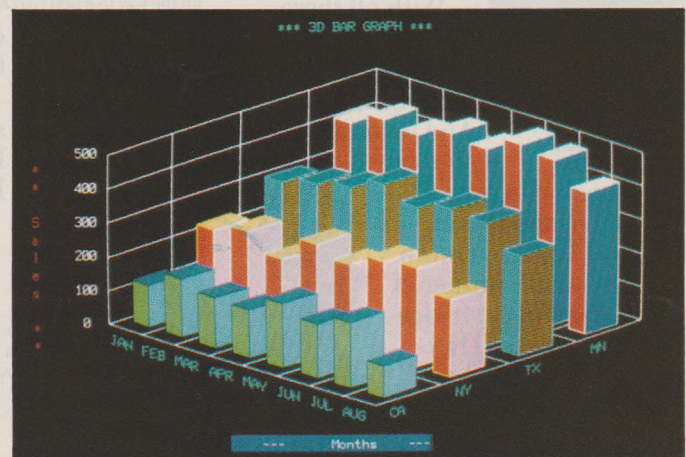
you'll be crazy about Open Access. It uses about half of the Tandy function keys to perform consistent operations throughout all modules, and you can assign additional functions or macros to shifted function keys.

Windows generally overlap, obscuring most of the frame underneath the active window. You operate in the current pane, and either close it to return to the prior window or open another on top of it for a new operation. You can split spreadsheets, copy text or spreadsheet data and partition graphs with windowing, but you can't tile (that is, abut) different function windows. Window size for a given function is fixed.

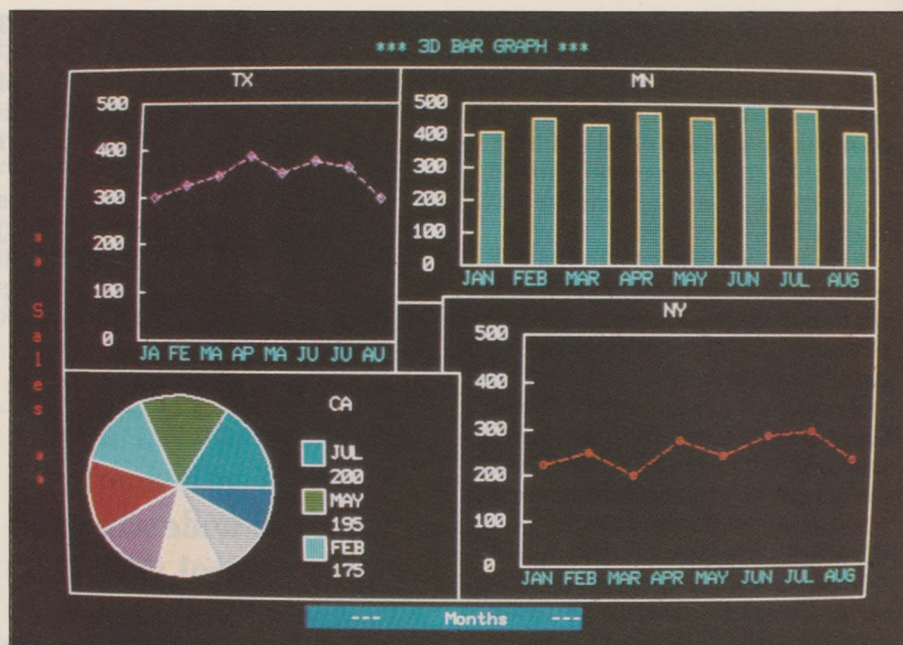
The package implements on-screen help nicely. Active keys for the current procedure appear in brackets



The calculator (upper left), the help window (bottom) and the function key chart (right) overlay the word processing screen.



Three-dimensional bar graph illustration.



Several graphs superimposed.

across the bottom of the screen, and the help key opens a window that explains the current operation. You can scroll the window for further details or press the help key again for a window that displays several function key assignments.

A built-in calculation window is a neat feature, especially for short computations in word processor tables and for constructing spreadsheet cells. It's also available in the database and the appointment calendar scratch pad mode.

Function keys activate other global window routines that list the directory of files or fields available for processing with your current command (a great time saver) and dump the screen to your printer without exiting to DOS.

The friendliest function key of all is Undo (assigned to the escape key on the Tandy). No matter what sin you commit within Open Access, hit Undo and you return to the prior status quo.

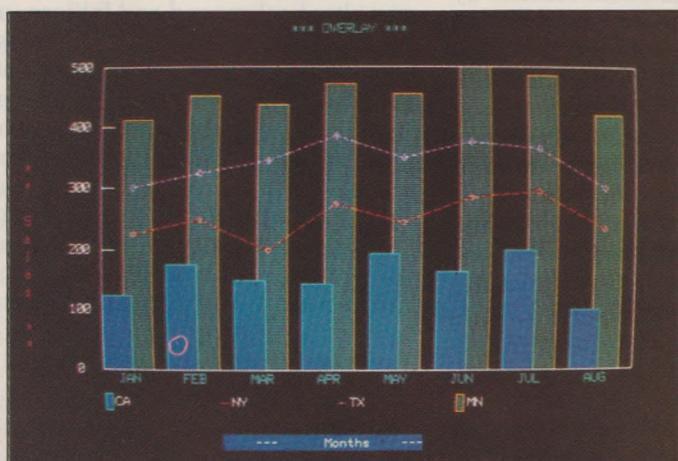
The Database Manager

The relational database management system of Open Access augments a wide range of command verbs with screen masks for data entry, print masks for reports and a query language for multifaceted, flexible data manipulation. You can link up to five files for retrieval at one time, using up to 15 possible sort keys. Breaking up your records into smaller databases for concurrent access can save storage space, avoiding repetitive nulls for fields that appear in a few records.

Comparatively, Lotus 1-2-3 has only a single database and two sort keys; dBase II works with a maximum of two database files at a time and seven sort keys. One Open Access record holds up to 55 fields and a total of 1024 characters—again an advantage over dBase II, which offers 32 fields and 1000 characters per record maximum.

Forms-oriented data entry and retrieval use a simple screen editor for preparing screen masks. You assign field attributes for the entry screen and create the database variable characteristics at the same time with a single menu-driven routine.

Variable types are text (alphanumeric and special characters), date, integer, decimal and logical. The host of control features includes justification, range checking, automatic



Quarter	Revenues	Expenses	Net Income
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3	9,600.00	5,400.00	4,200.00
4	8,600.00	6,000.00	2,600.00
Totals	34,100.00	22,000.00	12,100.00

THIS IS WINDOW 3

THIS IS A 4TH WINDOW

Spreadsheet Command Selection Menu

Blank	Copy	Delete	Edit	Format	Goal_Seq
Help	Insert	Locate	Name	Order	Print
Recalc	Setup	Transfer	Update	Window	Xternal

Windowed graphics.

Spreadsheet split into four windows with the help window open at the bottom.

insertion of default values, repetition of field for prior record and required entry other than null. One useful control validates an entry only if it matches a pre-existing value in another file (nice for applications that validate part numbers or customer names from a master file).

Report formatting is flexible; you create a printer mask to govern parameters. Open Access's syntax for record retrieval, modeled after IBM's query language SQL, is a pleasure to use and easy to learn. You can structure complex match requirements with recursive queries and a range function. Although macro command files, constructable in most of the modules, are powerful aids, they don't constitute a complete programming language comparable, for example, to dBase II.

The built-in Mailer program is a bonus that lets you substitute and merge variables. It's helpful for producing form letters, mailing labels and similar applications developed with the word processor.

The integrated structure and the ability to interchange data among modules is a major attraction of Open Access's database. You can transfer any portion of a database to spreadsheet, graphics or word processing files with the Context command. Unfortunately, the documentation for this powerful command is weak, and I had to experiment to learn to deal with its idiosyncrasies. Another way to transfer data is to convert information into standard interface file (SIF) format for use by other modules at a later time.

And in addition, Open Access can transfer externally generated data between its modules through utilities that translate ASCII, DIF or dBase II system data format (SDF) files to SIF format.

A Joyful Spreadsheet

Model capacity for Open Access spreadsheets allows a maximum of 3000 rows and 216 columns. You can assign a password to restrict access to a spreadsheet.

Your computational tools consist of a wide array of math, statistical and financial functions, including standard deviation, double-declining balance depreciation, internal rate of return, modified internal rate of return (financial management rate of return), linear estimate and table lookup. Entering data and moving around in the spreadsheet is as easy

as similar operations in Lotus 1-2-3. The many nested functions, the if...then...else logic and the application of relational and logical operators give you tremendous flexibility in structuring cells.

Computation speed is excellent (especially with the Tandy hard disk), and recalculations redraw the matrix in a hurry. The search function is fast and can locate any specified text character.

With the wide range of color control variables provided by Open Access, it's easy to generate exciting, colorful, high-caliber charts and graphs.

You can duplicate text as well as numeric data to speed model construction. To ease reviewing or altering a portion of the matrix, you can move it to the 0,0 coordinates with a single keystroke. Another feature allows you to lock first row or column titles or both as you roam the matrix, and to protect any cell from being overwritten.

To tame a large model (or for interesting visual effects), you can split the screen vertically or horizontally into as many as six windows, which you can scroll independently or join together for coordinated movement. By opening windows into two different models simultaneously, you can copy data from one to the other most efficiently.

For rapid review of if...then computations, the Update command changes all numeric constants in a given area for instant projections and lets you restore them with a few keystrokes.

Consolidation of several models with the same data format is permitted with seven-deep nesting of subsidiary models. You can, for example, total district sales into regional sales and regional sales into your final national figures in one operation.

An outstanding spreadsheet func-

tion that deserves special recognition is Goal Seeking, a feature usually reserved for mini or mainframe systems. With it, you can choose target values for one or more dependent variables, and Open Access applies an iterative process to calculate values necessary to arrive at the target result. This powerful procedure saves you a considerable amount of time by avoiding the necessity of interpolating and converging the figures by trial and error.

Open Access exports spreadsheet information to other modules in SIF format or through the Context command. Utilities let you transfer data to external programs. You can print the results of spreadsheet computations or the underlying equations in whole or part.

Although you can add page headings to your spreadsheet, the manual neglects to mention that you must first turn your printer on since the headings are printed immediately online. It took a discussion on the Open Access hot line to solve the enigma of headlines disappearing because my printer was off.

Overall, spreadsheet capabilities are quite broad and sophisticated and run smoothly, efficiently and rapidly.

Graphics in Living Color

With the wide range of color control variables provided by Open Access and the high-resolution graphics board of the Tandy 2000, it's easy to generate exciting, colorful, high-caliber graphs and charts. After inputting data by form prompts or via the Context command or SIF files, Open Access swiftly draws simple or overlaid line or bar graphs, striking three dimensional bar graphs and plain or slightly exploded pie charts.

Using a screen control panel, you can alter background and foreground hues (15 colors, three tones); change bottom, side and top titles; vary colors of different levels of overlays or dimensional elements of 3-D graphs; and pick symbols for line graphs and cross-hatching patterns. You can easily flip from bar to line to pie chart or from graph to control palette to try different color combinations and change the tilt and rotation of the axes of charts for a more dramatic viewpoint (impressive features!).

You can display several graphs on the same screen simultaneously, through overlays or with windowing and adjustment of individual scaling. With a bit-addressable printer, you

can print out any chart. You can also save it in an ASCII file for word processing use. Creating a graphics display with spreadsheet data through the Context command is remarkable in its simplicity.

Storing as many as 32 of your graphics "slide" productions in a "carousel" allows you to present an effective sequential show that's a real kick. You eliminate the delays inherent in programs that require involved procedures to load new files between screens. This outstanding streamlined function is one I think all presentation-type graphics programs should emulate.

Although suitable for most small businesses, Open Access graphics do lack some sophisticated features of new-generation graphics programs, which offer variable font types and sizes for labels and text, optional logarithmic division of horizontal and vertical axes and a greater variety of chart types. For sheer theatrical effect, though, the color graphics, particularly a series of slides from a carousel, are an absolute delight in a darkened room.

A Few Words on Processing

The word processing mode has the garden variety of text manipulation tools you'd expect from a word processor plus a few clever enhancements.

Some nice features include the abbreviation function, which stores up to ten phrases that you can recall by typing the abbreviation. Separately, the macro command lets you store series of steps, such as sequential printing of files, with a single command. Another enhancement is the Copy command, which allows you to duplicate data in your current file or split the screen and copy from another file into your present document. The Include command lets you tie documents together for sequential printing.

The word processor module lets you create form letters for use with the Mailer feature described in the database section. And again, the Context command or Copy command transfers data into word processing from other files.

Although lacking a few of the more esoteric features, such as sub- and superscripting, proportional printing, column manipulation and automatic hyphenation, the word processor adequately performs most typical home and business tasks. Compared to the

rudimentary text manipulation capability of Lotus 1-2-3, Open Access has true word processing with many complex abilities. However, even with the range of capabilities furnished, there are inconveniences.

The word processor has some nice features, but Open Access is clearly unsuitable for heavy, continuous word processing as its primary job.

For instance, the fastest method for ordinary typing is to use repeating backspace for deletion. Otherwise, you must press the delete key, which puts you in the delete mode. Then you must press another key to remove the word, sentence or paragraph. You still need to hit the Do key twice to confirm the deletions and return to adding more text. What a drag! Saving text to disk on a regular basis and returning to enter more text also takes several keystrokes and another menu.

Add this to the 80-column width limit and poor handling of single-sheet printing, and Open Access is clearly unsuitable for heavy, continuous word processing as its primary job.

Keeping Track of Time

The electronic calendar/appointment book/Rolodex for time and address management is a real charmer. For example, several professionals practicing together can maintain separate appointment registers on the system simultaneously.

You can enter short two-line notations for any day on monthly calendars through the end of 1999, view an entire month at a glance or view more detailed daily reminders on a five-line scratch pad.

You enter appointments individually with a form providing for name, subject and notations. Repetitive activities (like your Rotary meeting or Thursday golf date) are entered globally for any desired number of days or weeks. Similarly, you can mask lunch hour, coffee breaks or other special hours.

This module acts also as a Rolodex, so you can file names, addresses and telephone numbers. Though not dis-

cussed in the manuals, since the address records are really part of the database system, you can manipulate the address list with other database commands and print labels for general or selective mailings from your Rolodex file.

Ability to Communicate

The telecommunications provided in Open Access are plain vanilla. Default modem parameter files match the Hayes 1200 and 300 modems. You set bit rate, parity and stop bits and customize control sequences to match other modems with the configuration utility.

You can store up to ten numbers, as long as 15 characters each, in the phone directory for selection with the Search key, including symbols for delays you may require for MCI or Sprint. Open Access thoughtfully permits appending a phone number to a special access code before dialing.

You can copy to disk data received, and download or upload text files. The telecommunications program doesn't provide for special protocols such as Xmodem. That's an item on my wish list for a future version. The software notifies you when the capture buffer is open, and a real-time counter on screen updates the size of the captured file and remaining space available. You also get a utility for remote operation of another terminal.

The Incredible Paper Mountain

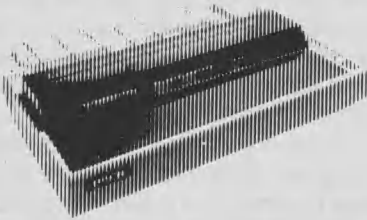
Documentation for Open Access is downright intimidating, until you consider that it contains information for six different programs. Support materials include a 43-page pocket reference guide; "Getting Started," a 44-page installation and customization guide; demonstration and tutorial disks; the user's manual, a four-ring binder containing several hundred pages; an index that is unfortunately three-hole punched so it doesn't fit into the user's manual; the reference manual; and several update sheets describing solutions to a few unusual problems. Also included are plastic function-key inserts for the top of the keyboard and a cardboard key summary.

Considering the amount of detail and the complexity of the programs, the overall content of the written documentation is reasonably good, but it has a long way to go for ease of use. Some of the more complicated database procedures need better organization and more explicit details,

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particularly in the user's manual. I felt a certain lack of continuity, partially in style, as though a different person wrote each main division using slightly different specifications.

Such ambitious and productive software definitely deserves better documentation. Sufficient quantity, but not enough quality.

Final Conclusions

You buy a lot of computing power and functionality with Open Access. Each module has sufficient bells and whistles to stand on its own, and each is enhanced by the integration between programs. The performance of the database and spreadsheet modules rates higher than the word processor, which has plenty of features but some clumsy operational aspects. The graphics are absolutely stunning. The time management and communications modules are solid practical programs.

If you want to be fluent in sophisticated use of Open Access, you'll have to invest a substantial amount of time and effort. You won't master its intricacies in a day or two. You have to experience hands-on the multiplicity of combinations and permutations of routines with the tutorial disk as your guide and plod through the manual pages at the same time. Unfortunately, the fact that the written documentation is disorganized will prolong the process.

Because of the host of special key functions, you'll need to keep the key assignment summary cardboard close at hand in spite of the secondary help window function table. The short reference guide is a definite help, but the tutorial methodology and program structure really require learning the sequences by rote. It's difficult to discern many logical patterns or mnemonic relationships that are common to all program modules and procedures.

Certainly with the Tandy 2000 and a hard disk, the program action is impressively crisp. Often, however, your selection of functions within programs requires multiple keystrokes or passing through submenus. The basic premise of this system gives you a chance to do or undo many actions, but it also necessitates an extra step. It's user-friendly but it also takes time.

Utilizing the Context command to transfer data between modules, without the time-consuming file conversions and program disk switching,

yields tremendous economy of effort and lack of aggravation.

Extensive on-screen help features, consistent use of several function keys and wide use of menus make it possible to start working with Open Access immediately, though at a slow pace. There's weighty documentation to help you, but it's a battle to become proficient. As I've indicated, the manuals are the weakest link and need substantial revision.

Open Access is a decidedly complex, coordinated system that offers substantial benefits from the application of window technology and integration. It is well-conceived and adequately implemented.

The package is balanced in its provision of universally appealing functions. You have all the major applications many home and business users seek interlaced in one multitasking yet reasonably priced package. If you haven't seen Open Access in action, especially in the hard disk environment, you owe it to yourself to experience a demonstration and determine its suitability to your needs. It's quite a bundle! ■

Editor's Note:

At press time, Software Products International announced release of version 1.01 of Open Access for the IBM PC. The new version speeds up spreadsheet manipulation by six to 20 times and supports inverse trig functions. An enhancement to word processing lets you save text without leaving the current mode; the software supports an internal modem card.

With the new version there is no limit to the size of data blocks transferred with the Context command (the previous version limited you to 64KB blocks).

Open Access 1.00 is the current version for the Tandy 2000.

Open Access 1.00

System Requirements: MS DOS or PC DOS 2.0; 192KB RAM; two disk drives; black and white or color display; high-resolution graphics board; printer; modem.

Manufacturer: Software Products International, 10240 Sorrento Valley Road, San Diego, CA 92121.

Price: \$595.

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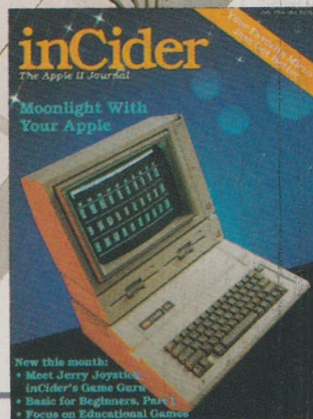
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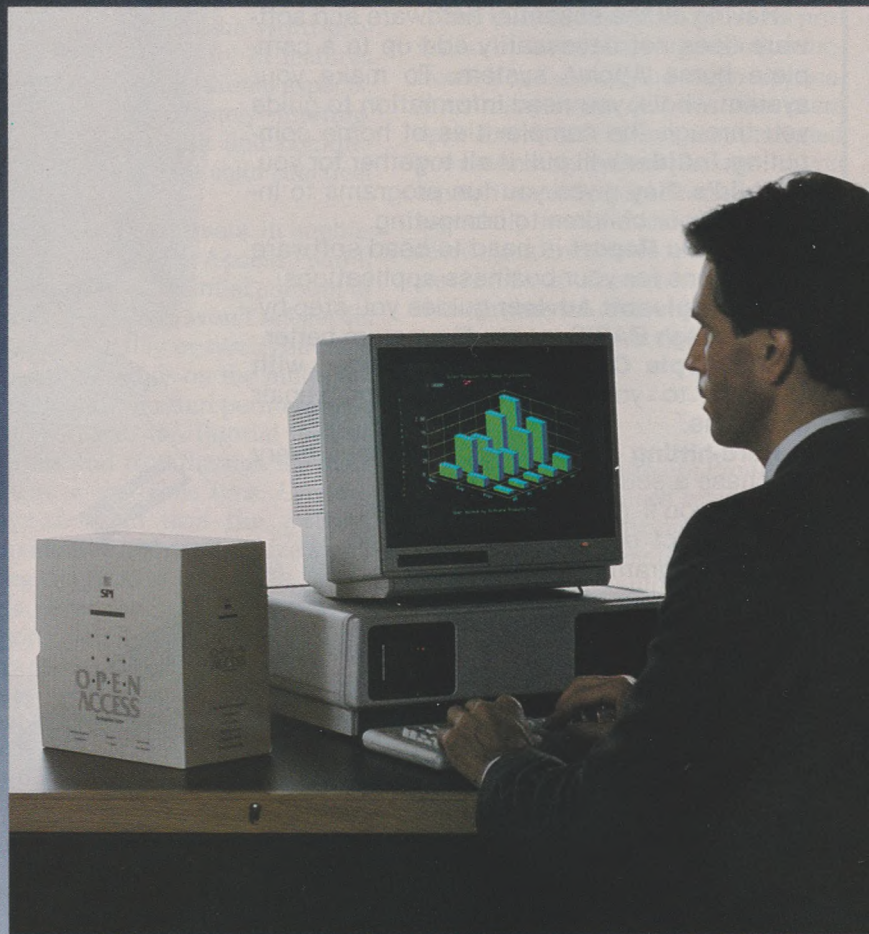
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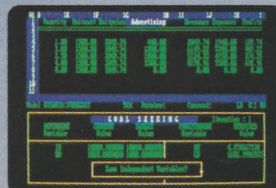


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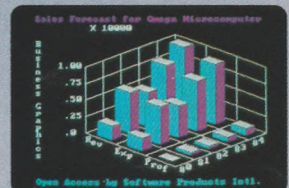
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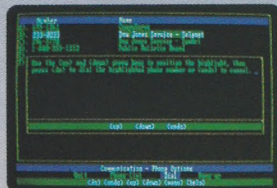
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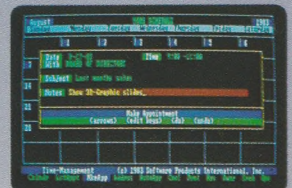
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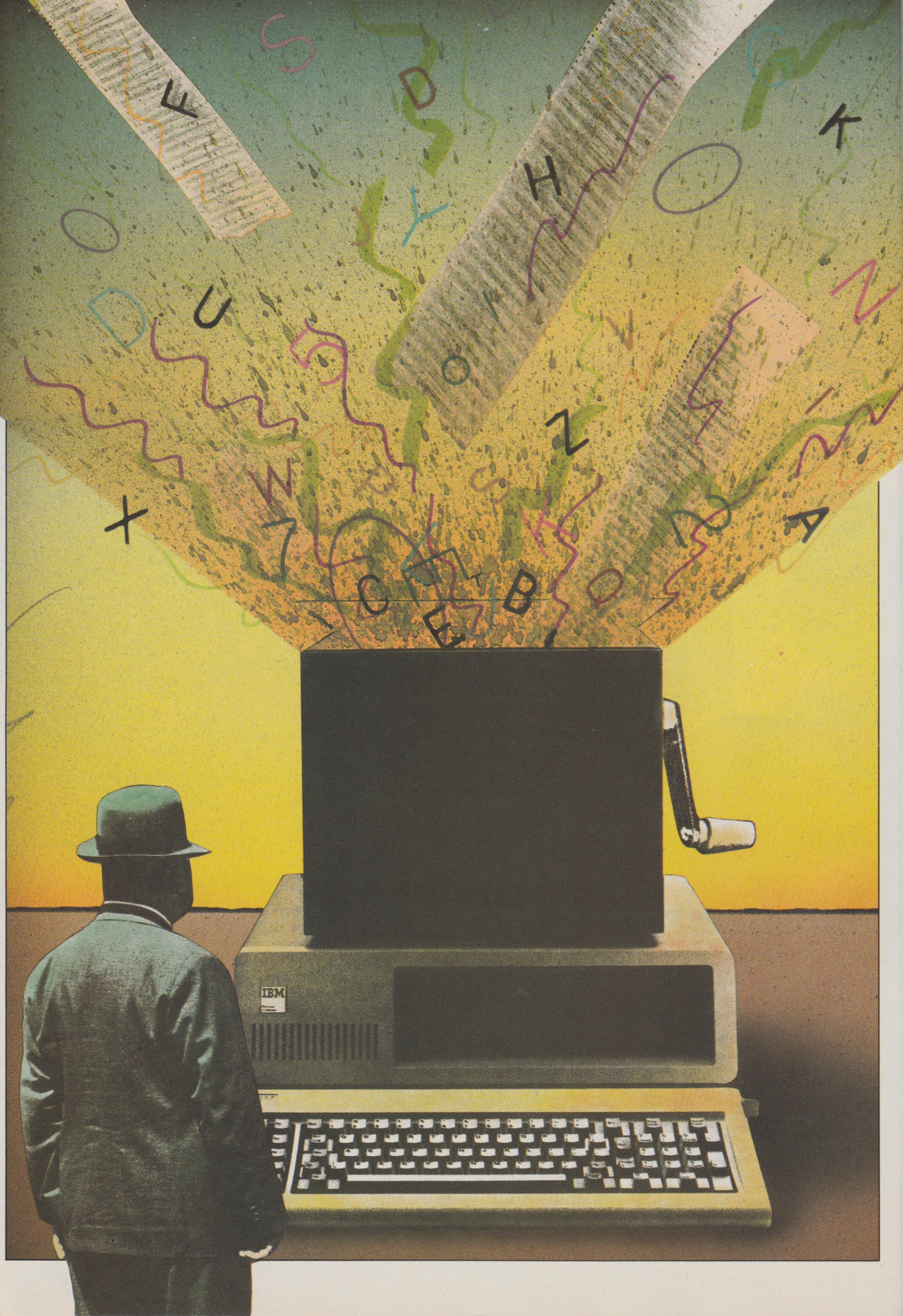



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The Word On Word Processors

Tom Bonoma wraps up his trip around the world of word processing in the second half of his two-part series.

Five word processing packages comprise the final installment of this series: EasyWriter II System, VisiWord and VisiSpell, WordMarc, SuperWriter and Samna Word III. Although more than 300 offerings fill the marketplace, I hope you can use these nine packages (four are reviewed in *Microcomputing*, October 1984) as a guide to help you in your shopping.

The evaluation chart continues with this installment as well. Let me remind you that the chart is not meant to stand alone; it's to support the text and make it easier for you to compare systems. And now, more word processing!

EasyWriter II System

The EasyWriter II System (EWII) has two variations: a \$295 package for personal use and a \$395 one for professional use. I evaluated the higher-priced spread, which consists of a page-oriented word processor, a mail-merge facility and a spelling checker. They're all bundled in a single binder but are separate programs with separate documentation. The package also includes a good "self-teaching document," Information Unlimited Software's euphemism for a disk tutorial and a keyboard template defining EWII's use of the function and alternate keys on the PC XT keyboard.

When I reviewed EWII for *Microcomputing* more than a year and a half ago, I remarked on the marvelous, almost direct drive feel of the keyboard-screen linkage in the program. The good news is that it's still there—when you type in EWII, you have a solid feeling that you can't outrun the software because it's somehow directly connected to the screen. Marvelous!

Semi-WYSIWYG?

EasyWriter II, like its more popular cousin MultiMate, is a page-oriented semi-what-you-see-is-what-you-get (WYSIWYG) word processor. The main menu for the system

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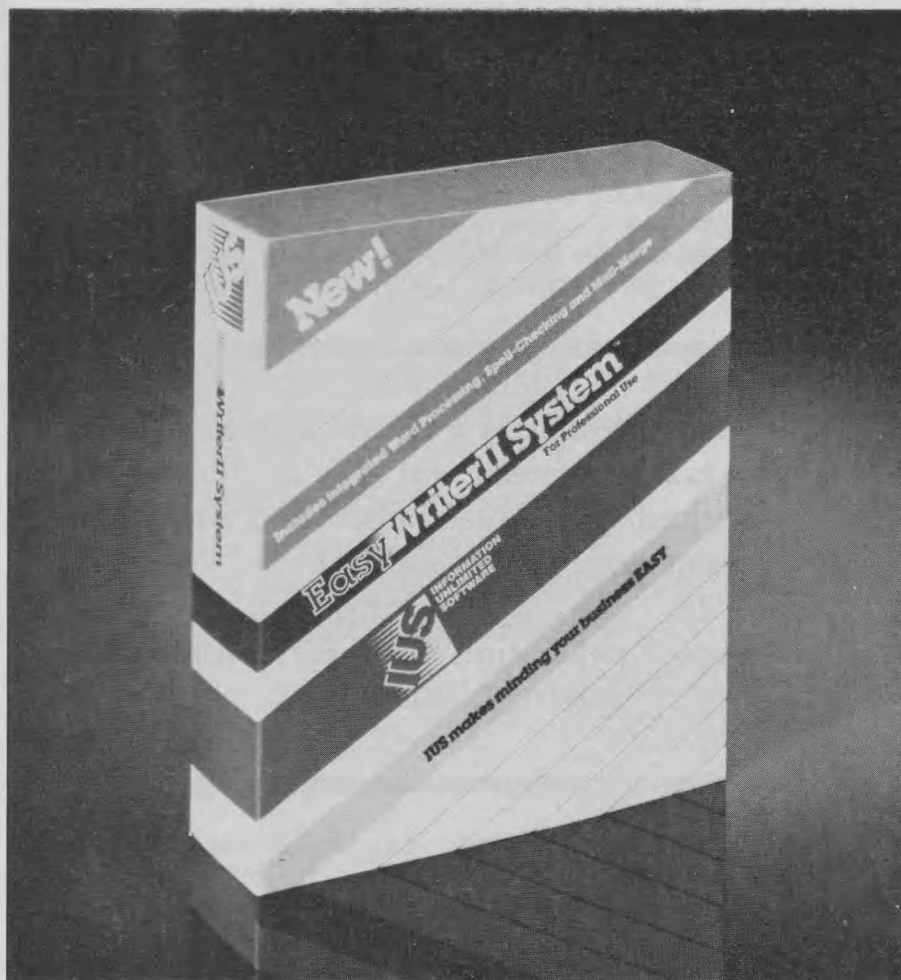
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The EasyWriter II System from Information Unlimited Software includes a word processor, a mail-merge facility and a spelling checker.

gives you nine choices, including opening a file folder (in which you store related documents), editing, printing or deleting a document, repaginating the text, setting the date (EWII doesn't pick up dates directly from the system), printing a directory of files in a folder and system functions.

System functions permit copying documents, editing the system's default formatting ruler, editing other system parameters, importing and exporting documents to the EWII system and changing printer configurations. I found the built-in help files less than helpful since several just explained the function in question without giving the keystrokes needed to make it happen! EWII also maintains restricted but helpful document summary screens that allow you to enter the typist's and document author's initials at the time of creation or revision.

EasyWriter II supports eight special fonts for printing, including shadow print, boldface, underline, double underline, super- and subscript. However, the display shows

characters in these special fonts only as underlined, in reverse video or boldface, so you'll need to look at a status indicator to see what the on-screen symbols mean in some instances. The system provides key clicks for audible feedback of a keypress, a welcome feature that you can disable if you desire. The system handles documents as wide as 255 characters.

Format rulers, which set margins, line spacing, tabs and decimal tabs, may be named (a limit of eight per document) and recalled as needed. It's awkward to set the system for double spacing because you have to take special precautions not to confound the line counter. Text typed in double space or other spacing doesn't appear that way on the screen either.

The text editor operates by "mode," so you can set the same keys to act by character, word, sentence, paragraph, line, block or page chunks of text. Though there's no hyphen help, you can adjust system parameters to equalize line lengths as they are typed.

Another nice feature of the system

is its ability to tag a chunk of information (up to about 4000 characters long) with a name and then copy, move or shift this chunk between documents. The 4000-character limitation is due to the fact that an EWII page can contain only this many characters. If you exceed this limit, the manual suggests pressing the F1 key to recover the document.

Speaking of recovery, one feature of EWII is its ability to restore any edited page to its unedited condition with a single keypress. While this function is a poor substitute for an undo, such a "super-undo" may sometimes come in handy.

After text entry, EWII can (from the main menu) paginate the document so that each page has an equal number of lines. You also can invoke a manual page-cut function to change the computer's automatic page break. Headers and footers can occupy any number of lines, can alternate between even and odd numbered pages and can support automatic page numbering.

EasyWriter II also supports a wide variety of dot-matrix and letter-quality printers, though you'll need to know the decimal ASCII codes necessary to invoke the functions you're interested in accessing. When you've configured your printer, EWII will support background printing (that is, printing while you're editing another document). Another good feature of the system is the ability to number text file lines automatically at print time, often a great aid for revisions.

Obvious Origins

EasyWriter II shows its early PC origins in a number of ways. While it's advertised as a what-you-see-is-what-you-get word processor, it clearly isn't one unless you consider a little "s" under the status indicator a good representation of shadowed type. The program doesn't do on-screen rejustification of text after inserts and deletes, but rather uses a WordStar-like reformat command to manually rejustify edited input, a major and unnecessary hassle. Footnotes aren't supported in any way and defined blocks aren't defined by highlighting (as with some of the newer systems) but by symbols inserted next to the text.

EasyMailer

EasyMailer (EM) is IUS's mail-merge facility for EWII. Even

though IUS supplies the software in the same package as the EWII word processor, you must install the mail-merge software in order to make it visible to the EWII program. After you do this, an extended functions command shows on the EWII screen, and you can choose the EM utility.

EasyMailer is a sophisticated mail-merger that allows you to maintain up to 50 fields per record and an unlimited (except by disk space) number of records. Like the EWII program, the limit is 255 characters per record. EM has on-line help available and allows you to use all of EWII's special fonts.

EasyMailer also has a useful sort option that allows you to sort data files on one field at a time. But its page-oriented structure limits EM because the system won't sort over page (or format ruler) boundaries. While the sort feature can be useful in developing sublists of sorted names, for instance, it poses severe restrictions on working with large, multi-page data files.

Rulers, familiar from EWII formatting, define the number and length of fields for each record. Essentially, you mark off on the ruler where fields end, what tabs should be inserted in each field and so on. The result is a template for records; you can define additional rulers with different tabs in the file as well.

EM has good features for manipulating data in records not ordinarily found in mail-merge programs. For instance, a field can be flipped around a comma, allowing last-name-first storage in the data file but correct addressing for a letter. Similarly, you can choose to print the data that's after or before the comma in a data field to write salutations without effort. Finally, the current date, as set in the system menu, is accessible with a single character in the EM program.

Though the program doesn't have if...then logical capabilities and is restricted by its page-oriented sort boundaries to single-page files if sorts are desired, it generally offers the kind of flexibility that you will really appreciate in high-demand mail-merge tasks.

EasySpeller

EasySpeller II (ESII) is EWII's spell-checker program. It doesn't have to be preinstalled on the EWII system; you call it from the edit

mode by typing a Ctrl-F1 sequence. When you press this key combination, ESII checks the data file for misspelled words against a 88,000-word dictionary (medical and legal dictionary versions of the EWII system are available at \$525 for each package). ESII checks documents page by page and can be aborted after any page has been checked.

ing thing is that the system could take several giant steps toward perfection with only minor coding revisions.

The last time I reviewed EWII, I complained bitterly about IUS's policy of charging an arm and a leg for phone support it should have provided free. In a good move, the company now gives six months of free

EasyWriter II is a competent word processing system, but it falls short in a number of areas concerned with completeness and ease of use. The system could take several giant steps toward perfection with only minor coding revisions.

When an incorrect or suspect word is found, you have several options. Hitting return adds a correctly spelled word to a custom dictionary and instructs the program to accept all succeeding occurrences as correct. Hitting F10 also accepts the word but doesn't add it to the dictionary. Verify (Ctrl-F3) looks up a contemplated correction to see if it is right, and Mark defers action but marks the word for later scrutiny and possible correction (there is a complementary Find Mark command).

What EWII doesn't do, as is evident from the above, is make in-text spelling corrections and/or change your copy automatically. This means that you must do spelling corrections manually (a tedious job that introduces more errors in the file if you don't use Verify), and you'll probably have to reformat text after it's corrected.

Competence Questions

EWII, in short, is a competent word processing system that falls short in a number of areas concerned with completeness and ease of use. It's clearly not really a what-you-see-is-what-you-get word processor. It's one step closer to WYSIWYG than WordStar but nowhere near Microsoft Word. It does provide mail merge and spell-checking but executes these in a competent but often frustrating way. The most frustrat-

ing thing is that the system could take several giant steps toward perfection with only minor coding revisions.

VisiWord and VisiSpell

VisiWord (VW) is a competent word processor with outstanding documentation and a superb spell-checking program. It's a good example of what has and hasn't changed in word processors between 1982 and 1984.

VisiWord isn't a true WYSIWYG word processor. Emboldened or underlined characters aren't displayed as such, nor are other special formats shown on either a color or monochrome monitor. Instead, the program puts a symbolic code (e.g., U/L) on the status line to indicate the special format chosen and displays all special formats in reverse video. The editor appropriates three lines and two columns from the video screen for its own use, so you won't get as much text to view as with systems that use pop-up menus or a more scanty information system. The ruler line, which shows margins and tabs, takes up the top line on the screen. Status messages, help messages and the functions menu use the bottom two lines.



WordMarc from Marc Software International Inc. is a capable high-end word processor on six disks.

Good Thinking

In many ways, however, VW is a miracle of good thinking regarding ease of use. You see a one-sentence description of each menu command on the next-to-last line of the screen as each possible choice is highlighted; the program fully supports DOS 2.0 pathnames and directory functions and even formats disks from within VW so you don't have to leave the system. The status line on the screen displays your position in the program in a rational manner; enter the Print function from the main menu, for example, and the system displays VW/Print, a usage familiar to anyone who's seen DOS 2.0 pathnames. More packages should use this function.

You only have two start-up choices with this system: create a new document or revise an old one. Once you make the choice, the main menu (reached with the escape key from the typing screen) offers Delete, Move, Copy, Layout, Find, Windows, Print, Storage, Options, Help and Exit choices to you. Some of these are worth explaining.

Layout offers a format sheet on which you can set line spacing, right justification, characters per inch (cpi), lines per page and even printer strings. While the system isn't completely flexible (line spacing is only from one-half to double in half-line increments and cpi is only ten, 12 or 15), it offers you many options.

The system can edit pages up to 10,000 lines long and documents up to 255 characters wide. It supports both tabs and decimal tabs (but not right-justified tabs). One document supports multiple format changes, so you can double space part of the text and single space the rest. The system correctly and automatically displays right justification and rejustification but not spacing, cpi and a number of other adjustable attributes.

Layout can also manage multiple document rulers so that you can vary tabs, and you can automatically indent paragraphs a prespecified amount with a single (F4) key. You can attach headers and footers to the document in Layout, emphasize characters (underline, super- and sub-

script, overstrike or ghost hyphenate in addition to user-defined functions) from the same menu and define one document to include others (append). Finally, you can define a print message to tell you (for example) to change print wheels in the middle of a document.

The Maintenance suboption in Storage has a facility that displays the word count for the queried document, a thoughtful feature. Also, an undelete key allows recovery from stupid mistakes, and two-window capability and automatic line centering are available. Up to three lines of headers and three of footers are supported, each with a left, center and right portion. The system deals automatically with pagination in these headers and footers. A competent print spooler permits editing while printing.

There isn't much to criticize with VW—unless you've seen VisiCorp's high-end VisiOn Word (VOW). Similar in design to VW, this program is the WYSIWYG word processor that VW should have been. It's a shame to see VW run after you've seen

VOW, because the latter has many of the same functions and menus but displays italicized characters as italicized, emboldens those that should be and generally works the way a word processor ought to in 1984. But I have to be careful about blaming VW for not being VOW, because it's not as expensive either.

In VW, the absence of footnote management and the restriction of spacing and cpi choices are silly omissions for the serious user, but no worse than some other systems. When you use an RGB screen, there's some unacceptable screen flicker and snow during input. I also found a constant need to hit the escape key, get the menu, pick it, get the submenu and then pick that. This became an exercise in frustration after I was familiar with the system. The function keys help, but not enough.

More to Praise

Overall, there's little to complain about and much to laud. The documentation is simply superb, a side-benefit from the VisiOn introduction, which uses similar lessons, sample applications and clear explanations. A function key template automates the new page, delete, undelete, indent, delete to end-of-line, center and underline functions for you so that you don't continually have to access the menu and, in addition, contains a helpful "again" key for repetitive editing. Though there's no disk-based tutorial, the Getting Started booklet has one that you can type in. Although VisiCorp continues its policy of selling disks that can't be copied and then offering a backup (for a fee) only when the registration card is returned, the company is pretty good about sending backups promptly.

VW System Star

It's VisiSpell (VS) that's the star of the VW system. Chosen from the options menu on VW, the system prompts first for insertion of the VS system disk, then the dictionary disk (the B: drive is occupied with document storage on a floppy system), necessitating much disk swapping unless you have a hard disk. But, once accessed, the speller literally sings!

It automatically starts proofing the document, stops at unrecognized words, suggests corrections if they are misspelled and then makes them! This makes proofing an easy

matter, so more of us will engage in it. Though the program has the facility for marking, updating, changing or deleting words from the custom dictionary and other maintenance tasks, this simple description is all you need to know about VisiSpell. It just does the job quickly, quietly and automatically. If you can put up with the disk swapping, it's the best speller of all those evaluated here. It must be used with VW, however, and can't be used with other word processing programs—a limitation in my opinion.

WordMarc

WordMarc (WM) is a capable, high-end word processor that comes complete with document spell-checker, an abbreviation system, a document encryption system to keep sensitive data away from prying eyes, a document recovery utility and even automatic form letter generation with variable insert (i.e., a crude mail-merge facility). The system is on six (count 'em!) disks, a number topped only by Samna Word III. The documentation, although adequate, is no great shakes and is more suited to the "techie" mainframe user than the secretary. It refers to whether you've "logged on" to the system but thankfully separates a technical manual from the user-relevant stuff.

mats rather than displaying them. Though the screen shows right justification, WM is more correctly categorized as a WordStar-plus format than as a true WYSIWYG.

A clear and understandable main menu drives the editor itself, which is nicely powered by function- and cursor-key use. I've seldom seen such fast screen repaint as in WM, and the system's other functions operate nearly as fast except during disk loads, which are relatively infrequent. WM has particularly useful cursor control; instead of character, line, word and other modes, you simply hit a forward or reverse key and then type a character that resides close to where you want the cursor to go.

Similarly, you mark blocks for deleting, underlining or whatever by hitting the function in question, some punctuation or a character lying near the destination, and the execute key (the big plus key on the PC keyboard). What could be simpler?

Uncluttered Display

The full-screen editor presents an uncluttered display, using only a few lines at the top of the screen for a ruler and necessary messages. The often annoying "you are at position 51, line 20" messages constantly displayed by some systems aren't shown in WordMarc, but they're only a

There's little to complain about and much to laud in VisiWord: the documentation is simply superb; and the VisiSpell speller is the star of the system—all you need to know is that it does the job quickly, quietly and automatically.

Professional Workhorse

This word processor is clearly a professional workhorse and is designed to compete with dedicated systems. Though advertised as a WYSIWYG, the system, for the most part, highlights special character for-

function key away. Other function keys or special keystrokes handle automatic centering, indentation, decimal tabbing, overstriking, emboldening text, repagination and similar functions.

When it is time to revise a first

draft, the editor allows convenient movement by screen and page. The system provides a good move, copy and external copy feature, and wonder of wonders, automatic hyphenation. WM's interactive speller does not make automatic corrections or even suggest correct spelling to you. Thus, it's more useful as a typographical error corrector. However, the system quickly accesses the 40,000-word dictionary, and user-definable dictionaries are available.

WordMarc also supports a glossary function where you can store letter closings and automatically recall them to avoid repetitive typing.

it'll cost you 50 bucks, a problem in my opinion. But, if you can decipher the technical documentation, it's not likely you'll need support. WM supplies a number of utilities with its system that allow terminal and printer reconfiguration (to the Eagle and Compaq, for instance), menu customization, error message and prompt customization and others. The system can both read and write ASCII files, a major plus. You can even buy an EPROM from WM, which allows full 192-character support on your compatible printer. Or, if you're French, Norwegian or one of a number of other nationalities,

screen formatting. SW is simply a good tool for editing, laying out and then printing words, where you learn the dot commands and other formatting tools and the system executes them on paper.

SuperWriter is menu-driven. The main menu allows editing, printing, spelling, directory access and utility access. The latter provides access to SW's library files, which essentially are structured as automated sets of boilerplate paragraphs that you can choose from SW's good mail-merge facilities to customize letters and other correspondence. SW also has document history screens available from this menu that track modification dates, operators and the like for everything on the disk. The dictionary maintenance function allows manipulation of SW's semi-integrated speller, and a SuperCalc hook produces spreadsheets for text inclusion or exports text to the SuperCalc program.

Sorcim's SuperWriter system hits its full maturity in version 1.03. You can do whatever word processing tasks you want to with SW, as long as you don't care about on-screen formatting. SW is simply a good tool for editing, laying out and then printing words.

Editor Performs

The editor is where you'll spend most of your time, however. This device is especially functional for the person who learns its complex reaches. SW operates from a succession of control keys, PC function keys, escape keys and dot commands to control the appearance of printed text. Control keys, like Control-P, allow for boldening, centering, indenting, italicizing, justification, underlining or superscripting characters and lines. Function keys put markers in the text to call for a form feed or to block off (no cursor pointing here) sections of text for copying or moving. The escape keys, the largest set of commands, control normal editing functions like text moves, copying, find and replace, global formatting options and document saves. The net result is a system that can do almost anything if you know what to do! Fortunately, the on-line help (answer screens) SW has added to the system make it easy to use this program quickly.

The cursor moves by character, word, line, screen and document, (state-of-the-art in earlier word processing systems). Facility exists for block moves, copies and saves across files as well as within files, and an extensive include facility allows external file parts to be imported into the working file in such a way that a document can be created quickly from standard boilerplate paragraphs.

You can change the system menus used to control WM and customize WM's standard document formats (letter, others) to fit your needs. Printer configuration is extensive on WM, but slants toward letter-quality machines. One interesting feature of the system is its ability to enable DOS commands from within and then to return to the document you are editing.

WM handles lines up to 163 characters wide and prints them proportionally, assuming you have the gear. Spacing is single, double and triple in addition to half-spacing. WM offers only three pitches despite the ability of these high-quality printers to handle more. The system provides automatic window and orphan control and offers a mail-merge-like facility that allows you to store text fields in a data file and then merge them with a standard document for printing. However, few formatting or other options to manipulate the data file are available in WM.

If you want WM hot line support,

versions of WM exist in your native language.

WordMarc's menus and clean screen make it an especially attractive word processor. Its fast operation makes it even more so. If you do heavy production writing and don't need footnoting capabilities, you'll be hard pressed to do better than this system. If you have writing security needs that can use the data encryption facility, this is one of the few systems that actually can protect what's written, recover it if it's botched and generally provide the kind of security you might expect for your words.

SuperWriter

SuperWriter (SW), Sorcim's entry into the word processing arena, is a good adaptation of the late '70s Magic Wand program. In version 1.03, the system hits its full maturity. You can do whatever word processing task you want to with SW, as long as you don't care about on-

Control characters, like returns, as well as hyphens and blanks can be made visible or invisible in SW, a major plus. A normalization option allows automated capitalization or reverse capitalization by character, word and line, also a time-saving feature. Also, a number of markers, including place markers, can be left in the text for later revisions.

All this is done *without* accessing SW's command characters and embedded commands, which serve as print-time directives to the system. These provide paragraph indentation, multiple spacing (not shown on the edit screen), left, right and full justified text printing and the like. When a document is edited, a separate formatting program (Print from the menu) allows you to preview the text as it will print on the screen or be sent to a printer or a disk file. You can insert multiple line headers and footers into the text with still more embedded commands, and automatic pagination is supported. If your hardware handles proportional printing, the system is completely comfortable with it.

SuperWriter has an extensive facility for mail merging and other variable text applications, all handled with a complicated but most thorough (if/then-capable) mini-programming language that allows complicated data files to be created and then selectively accessed for correspondence customization. For instance, it's relatively easy in SW to establish a file of contributors for a charity, then to write separate letters to male and female contributors, and within each gender category to write separate letters to those who gave more than or less than \$100 to the campaign.

SuperWriter's spell-checker is the old SpellGuard, a first-generation device that takes edit files and marks the suspect words for manual revision or else adds correct ones to the dictionary. A small 20,000-word main dictionary is supplied with the system, but facility is provided for custom dictionaries as well. A welcome feature of this system is the statistical aspect of the document summary sheet (word count, unique word count and so on) that's generated when Spell is called from the main menu.

Think it does everything but wash the car? Wait—I haven't mentioned the advanced features yet. SW supports execute files, which are files of

macros that automate any number of tasks, from multiple search and replace to emboldening a given word in any file. The system also verifies that its own code is correct, and it can be revised in the future to fix bugs by working from a master sheet of corrections.

SuperWriter is the best example I can think of citing to show how far a two-pass editor and print formatter can go. Clearly, nothing (except footnote management) is missing from the system. Whether you choose this one or one of the single-pass, on-screen formatters has to do with both computer preference and willingness to trade off WYSIWYG for more flexibility and options. In general, computer users have been unwilling or unable to make this trade, which accounts for the increasing popularity of the WYSIWYG one-pass programs and, undoubtedly, for the fact that all companies *claim* such capability whether or not their software can deliver it.

Samna Word III

Do you desire color word processing, spell-checking, footnoting capabilities, indexing, automatic tables of contents, headers and footers, automatic hyphenation and a small graphic representation of how a page will look when printed? You've

come to the right place—Samna Word III—and for a price, you can have it all! I'll get to the price later; first, a small message about the features.

No Small Fry

Samna Word III is one of the most complete word processors available for the IBM PC and XT. It requires DOS 2.0 or better and 256KB for operation, so it's no small fry in the memory requirements department. For the most part, Samna is a WY-SIWYG word processor: on-screen justification, margins and special typefaces are displayed in a form similar to that in which they'll be printed.

The chart contains a summary of Samna Word III's functions. Here, I'll concentrate on usage characteristics and on some of its unique options. SWIII's developers created a program that's internationally as well as scientifically useful. You can choose seven different keyboard layouts under software control, including English, French, Canadian bilingual, math/Greek and an "alternate symbols" keyboard that offers some special keys like a copyright symbol. Though these symbols don't show on the screen, they do print correctly. Keyboard selection is as easy as hitting SWIII's select key and then choosing the keyboard for use.

Samna Word III's mail-merge fa-



Samna Word III from Samna Corp., one of the most complete word processors available for the IBM PC and XT, requires DOS 2.0 or better and 256KB.

cility is a good one, and it also doubles as a forms generator and records file. To create records files, you define the names of the items you want in the file by "painting" a form with variable names. In the mail-merge mode, a standard document is created with markers, indicating which variables from a records file are to be included at print time. The records file uses a single key field, allows file searches, accepts data entry in bold, underlined or whatever format and allows editing of entered information as well. When coupled with the word processor's math mode processor, SWIII comes pretty close to offering you an integrated list management program as an added bonus to the word processing functions.

line boundaries. SWIII supports automatic footnoting with footnote renumbering and the splitting of long footnotes across two pages, as long as dual window editing is not in use. (The footnote manager uses the second window to store footnotes in a file, which accounts for the restriction.)

A glossary function lets frequently used boilerplate phrases or paragraphs be stored, recalled for a document or printed out in an archival listing of the glossary. Up to 30 headers and footers may be stored with each file, and a good multiple-level help facility is available to you. This makes SWIII learnable, if not easy to use, in spite of its complexity.

Semiautomatic indexing is available after you type a list of the words:

including daisy wheels that can handle proportional spacing. However, I found a serious bug in the Diablo 630 print driver that made this printer unusable. (Samna promises a fix "real soon now.")

The system does automatic section/outline indentation and numbering and generates tables of contents. A translate facility imports ASCII files to Samna's format and exports Samna files to ASCII. However, when I attempted to use it, the system overwrote an entire floppy disk and destroyed it!

Paying for Mistakes

Now, what's that price I mentioned? Well, partially it's dirty code—I found a number of bugs in SWIII, some potentially fatal to your disks—like random characters being put on the monochrome screen when zoom was chosen on a color one and a bad print driver. The price is careful but less than useful documentation, too. The SWIII manual reflects the triumph of the need to alphabetize over functional organization, which can be hard to work with. Even with disk tutorials and enough reference cards to keep warm in the Arctic, the system's hard to learn.

But the real price for SWIII is in speed of operation and complexity in design. Samna's multiple functions and large memory requirements take their toll in speed in some of the functions that you want to happen quickly with a word processor, like cursor moves, rejustification and repagination. Some of these things happen at a snail's pace in SWIII.

None of them are slow enough, however, to warrant a charge of disfunctionality for the program. It works, but it does some things just at the border of "too slow" with a hard disk and "awesomely slow" with a floppy. If you can use the features of this word processor, it's without a doubt one of the most extensive on the market. I'd get a demonstration first, however, to see if the speed of operation is tolerable.

A system with this many options requires so many controls that sticky templates and all kinds of reference cards are needed for operation. In addition to the ten PC function keys, several other keys (do, select and mark) have more than ten options or so each, giving the new or unfamiliar user a labyrinthine set of choices.

The issue's not just complexity,

(Continued on p. 98)

The list of Samna Word III features goes on and on—but there's a price you have to pay. Samna's multiple functions and large memory requirements take their toll in speed—some functions happen at a snail's pace in SWIII.

Fold and Zoom

Two interesting features in SWIII are fold and zoom. The former literally folds a wide screen in the middle so that you see the left and right halves together, squashing the middle. This function works the way you might wish your spreadsheet would: show me January and December and forget what's in the middle.

The latter function, available only to users with a graphics monitor, displays a small pictorial representation of the way the whole printed page will look when output. This function is especially useful for checking the placement of text.

More Features

The list of SWIII features goes on. An integrated spelling checker and corrector verifies spelling, does automatic replacement of misspelled words, offers alternatives and performs automatic hyphenation of words at

the program then inserts the page numbers where that word or phrase appears. Line drawings are supported simply by touching the control key and any arrow key to make boxes and arrows.

Also interesting is SWIII's math mode, a relatively easy-to-use yet extensive set of mathematical functions available right on the word processing screen. The math mode gives you a four-function calculator, which can "pick up" and "put down" values in the text, compute percentages or make other manipulations on rows and columns, and then put the answer back where it belongs. Even the number of decimal places displayed can be selected.

Finally, if all this isn't enough, SWIII even has the facility to handle (but not display) two-column newspaper-style text. It isn't easy to do, but it's supported. Also, the system supports a wide variety of printers,

Feature	Samna Word III 1.0	EasyWriter II System	VisiWord and VisiSpell 1.0	WordMarc 4.0	SuperWriter 1.04
System Requirements	256KB, DOS 2.0 1 DSDD floppy or hard	96KB 1 SSSD/DSDD floppy or hard	192KB, DOS 1.1/2.0 1 floppy; 1 other, floppy or hard Mono or Color	256KB 2 SSSD or DSDD floppy or hard Mono	1 SSSD or DSDD floppy or hard Mono
Printers Supported (see legend)	1-18 plus others	All printers, user configures	6-8; 13-15	More than 40 printers	2, 4, 5-13, 15 plus Anadex, IBM color, C. Itoh
Documentation					
Features					
Disk Tutorial	•	•		•	
Book Tutorial		•	•	•	•
Reference Card	•	•	•	•	•
Key Overlay	•	•	•	•	•
On-line Help	•	•	•		•
Toll-free Number	•	•			
Filing Scheme and File Access					
Drawers (disks), Folders and Documents		•			
Automatic Backup	•			•	•
DOS Subdirectories	•		•		
Long Names		•	•		
Document Summary Sheets		•	•		•
Directory Display	•	•	•	•	•
Display					
WordStar-like Codes					•
Highlight	• +	• +	•	• +	
Fully Formed Graphics					
With Headers, Notes					
Formatting Features					
Multiple Format Lines	•	•	•	•	
Tabs and Decimal Tabs	•	•	•	•	•
Right Justification Tabs					
Standard Defined Document		•	•	•	
On-screen Right Justification	•		•	•	
Automatic Reformat	•		•	•	
Automatic Hyphenation	•			•	
Widow and Orphan Control	•	•		•	•
Dot Leader Tabs					
Indentation	•	•	•	•	•
Vertical Centering	•				
Cursor Movement					
By Character	•	•	•	•	•
Screen		•	•	•	•
Word	•	•		•	•
Line or Edge	•	•	•	•	•
Sentence	•	•		•	
Punctuation				•	
Page	•	•		•	
File	•	•	•	•	•
Paragraph	•	•		•	
Mouse and Thumbing				•	

Feature	Samna Word III 1.0	EasyWriter II System	VisiWord and VisiSpell 1.0	WordMarc 4.0	SuperWriter 1.04
Cut and Paste					
Block Delete	•			•	•
Archive Delete				•	•
Block Insert		•	•	•	•
Glossary	•			•	•
External Copy	•	•	•	•	•
Windows	•		•		
Transposition					
Normal Move/Copy	•	•	•	•	•
Column Moves, Math	•		•	•(no math)	
Undelete	•	•	•		
Search and Replace					
Global	•	•	•	•	•
Discretionary	•	•	•	•	•
Wild Cards				•	
Case Ignore	•	•	•	•	
Directional	•			•	
Whole Word Only	•	•		•	
Pagination					
Required Breaks	•	•	•	•	•
Automatic Breaks	•	•	•	•	•
Automatic Repage	•	•	•	•	
Goto Page	•	•	•	•	
Place Marks	•				•
Headers, Footers					
Multiline	•	•	•	•	•
Alternating	•	•	•	•	
Automatic Page	•	•	•	•	•
Automatic Date					
Display with Text					
Where It Starts	•	•	•	•	•
Special Functions					
Case Reverser	•				•
ASCII Graphics	•			•	•
Automatic Date Insertion					•
Key Merge					•
Auto Time Insertion					
Spaces as Dots	•				•
Footnotes at Bottom	•				
Footnotes at End	•				
Special Attributes For Characters					
Underline	•	•	•	•	•
Double Underline	•				
Bold/Shadow	•	•	•	•	•
Expanded					
Italics					•
Proportional	•			•	•
Color Support					•
Super/Subscript	•	•	•	•	•
Compressed					
Overstrike	•	•	•	•	•

Feature	Samna Word III 1.0	EasyWriter II System	VisiWord and VisiSpell 1.0	WordMarc 4.0	SuperWriter 1.04
Printing					
Default Format	•	•	•	•	
Spooler	•	•	•	•	•
Abort	•	•	•	•	•
Pitch Control	•		•	•	•
Page Length	•	•	•	•	•
Lines per Inch	•		•	•	•
Hot Print	•		•	•	
Sheet Feeder Control	•		•	•	•
Page Start/Stop	•		•	•	•
Multiple Copies	•			•	•
Odd Spacing	•				•
Mail Merge Printing					
Has Feature	•	•		•	•
Read ASCII	•			•	•
By Field					•
By Word in Field					•
By Character in Field					•
Forms Support	•	•			•
If...Then Programs					•
Include Command					•
Speller					
Has Feature		•	•	•	•
Third-party Offerings	•		•		
In-text Correct		•	•	•	•
User Dictionary		•	•		
Big Dictionary					
Thesaurus					
Communications/ Import and Recover					
ASCII to WP	•	•	•	•	•
WP to ASCII	•	•	•	•	•
DIF				•	
Document Recovery		•		•	
Printer Legend					
1. Prowriter	7. Epson FX	13. Diablo 630			
2. IBM	8. Okidata Microline	14. NEC 77xx			
3. Prism	9. Okidata Pacemark	15. Qume Sprint xx			
4. NEC 35xx	10. TI 850	16. Brother			
5. Generic	11. Toshiba P1350	17. Smith-Corona			
6. Epson MX	12. Starwriter	18. Mannesman Tally			

either. You get a distinct feeling of inelegance in the way the package goes about things.

Somehow it just doesn't hang together as well as it should. Perhaps this will be handled in revisions. SWIII offers significant power but demands a significant investment and much tolerance in return.

Not Much Really New

What's different between 1982 and 1984? With the exception of a few

ground-breaking programs like Microsoft Word, very little. Most word processors, judging from the ones I've reviewed, still claim far more than they deliver in terms of WYSIWYG. Most remain heavily influenced by the WordStar "let's substitute funny little characters for what the user really means" philosophy, and indeed, WordStar may continue to be a good choice among these new entries if that approach satisfies you.

Most of the programs still can't handle tougher word processing tasks,

like proportional printing, footnote management and so on. And, most still represent a somewhat idiosyncratic approach to the job that requires a major investment on the part of learners.

However, there has been some progress. Disk-based tutorials, extensive function key usage, color monitor support and on-line help are now correctly regarded as *de rigueur* by the user. Word processing is quickly moving toward integration, like other software, with an increas-

ing profusion of more or less well-integrated spelling checkers and mail-merge utilities. Programmers are increasingly sensitive to the need for word processors to talk to the outside world in one way or another, whether through ASCII-to-word-processor utilities or some other manner.

Glimmers of a far different future are on the horizon. Programs like Word, Samna and others are starting to offer the word processing community some real WYSIWYG qualities. Other approaches, like the one WordMarc uses, compete well with dedicated word processors. And, for those who prefer two-stage word processing, the Magic Wand-like command key and formatting programs have reached their full maturity.

Little Advice

What advice can I give you for making a choice in this environment? Very little, I'm afraid. None of

the programs evaluated is a rip-off, but I simply couldn't work with some of them every day. That, however, is colored by how I use a word processor, and that is the criterion that you should base your decision on in evaluating word processing packages.

For all-around capability at an affordable price, it's hard to beat VolksWriter Deluxe. For top-of-the-line WYSIWYG abilities, Microsoft's Word is a clear standout. But, depending on your needs, any of the packages might be a good purchase.

Perhaps the best advice I can give you is that in this world of hype, vaporware and empty promises, it's tempting to be somewhat dissatisfied with whatever you have and to keep looking around the corner for that one perfectly suitable program. Sit back, settle down and don't worry. It hasn't been written yet! ■

*Address correspondence to Thomas V. Bonoma,
45 Drum Hill Road, Concord, MA 01742.*

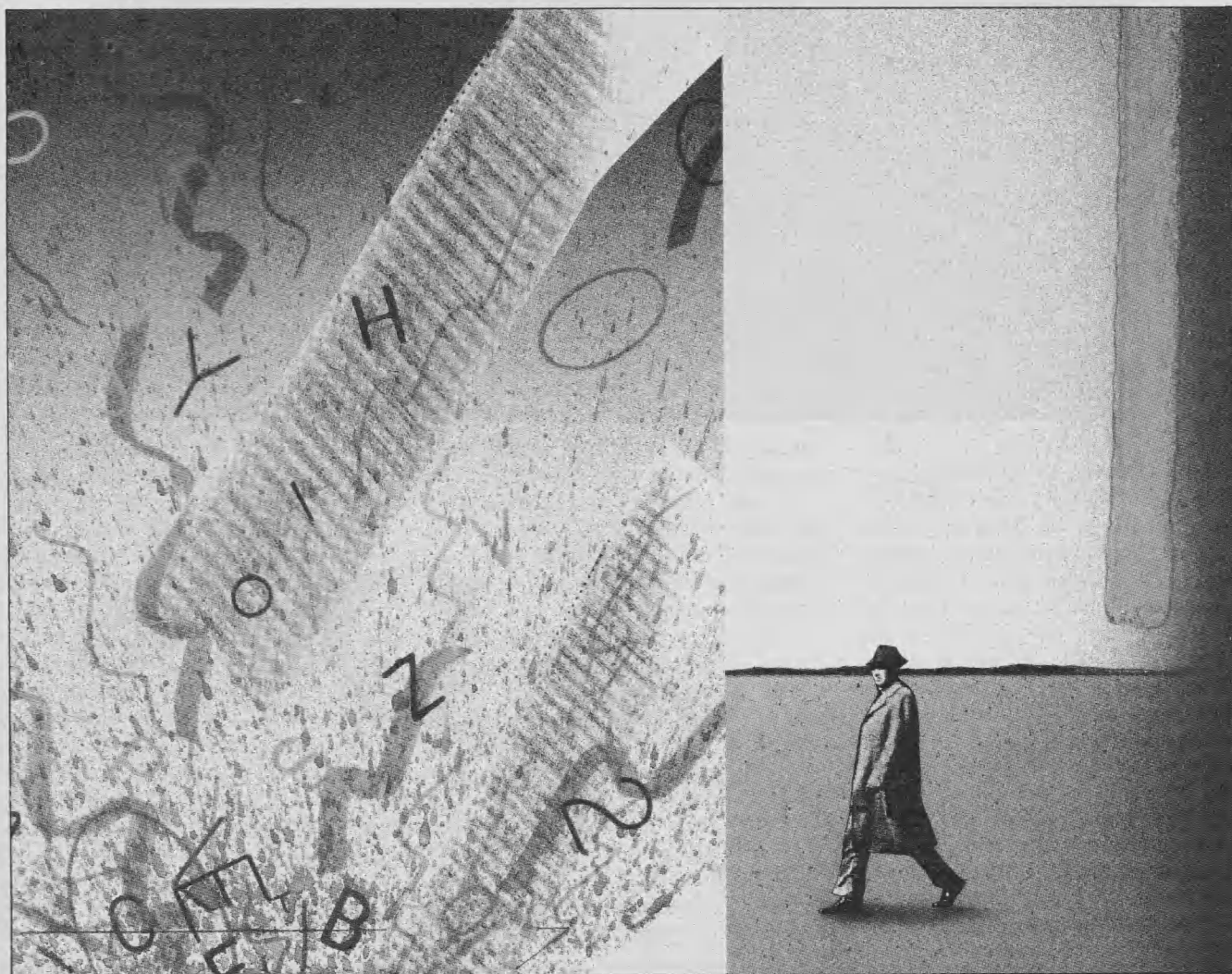
EasyWriter II System (\$395)
Information Unlimited Software Inc.
2401 Marinship Way
Sausalito, CA 94965

Samna Word III (\$550)
Samna Corp.
Suite C-1200
2700 N.E. Expressway
Atlanta, GA 30345

SuperWriter (\$295)
Sorcim Corp.
2310 Lundy Ave.
San Jose, CA 95131

VisiWord Plus (\$195)
VisiCorp.
2895 Zanker Road
San Jose, CA 95134

WordMarc (\$495)
Marc Software International Inc.
260 Sheridan Ave., Suite 200
Palo Alto, CA 94306





Electric Desk

No Razzle, A Little Dazzle

Not everyone needs an integrated software package that offers six applications, a programming language and so on. Electric Desk is an integrated package for the rest of us. It offers the essentials (word processing, a spreadsheet and communications) for \$295.

By Eric Grevstad
Senior Writer

Let's be honest: many people would prefer a pops concert to a Symphony. Integrated software products grow more dazzlingly powerful each month, but most computer users don't. To the nontechnical executive who does a daily hour or two of light spreadsheet or database work, a package that costs \$795, spans six applications and a programming language, and pushes PC hardware to its limits on 512KB and a hard disk might seem like buying an MX missile to kill garden pests.

For those users, there's Electric Desk—database, word processing, spreadsheet and communications abilities, packed onto a single disk (you'll need a second drive for data)

and priced at \$345. Even with lots of menus and help screens, Electric Software Inc.'s program fits in a measly 256KB RAM; if that's too much, producer Alpha Software Corp. has crammed it into a 128KB PCjr, using one floppy and two cartridges (\$295).

I don't know about the PCjr version—I found 256KB was barely enough, though maybe Junior's use of cartridges would free sufficient workspace—but I'm reasonably impressed with the PC model. Juggling texts, spreadsheets and databases is sophisticated stuff, but Electric Desk makes it so easy I'm tempted to call the program pfs:Framework. As a painless introduction to integrated

software, it earns a solid A minus.

Against that, it scores a C on integration's main test: its applications aren't as good as stand-alone programs. A specialist would never use Electric Desk's spreadsheet instead of 1-2-3 or its word processor instead of WordStar. But for light to medium use and one-disk convenience, Electric Desk is worth a try.

At Your Services

If other multiware programs hog memory, Electric Desk hogs retail shelf space; it comes in a box twice the size it needs, with a large plastic tray holding the manual and a vinyl package with two disks (system and

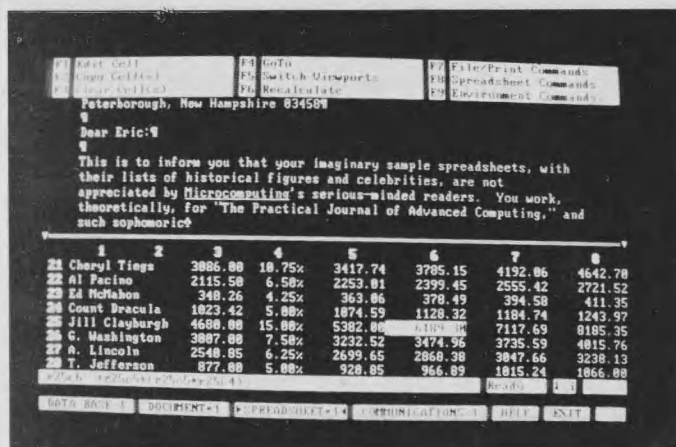


Photo 1. Electric Desk shows off its split-screen ability with a word processing document at top and a spreadsheet (the active application) below. Note the function key menu and cell formula in reverse video.

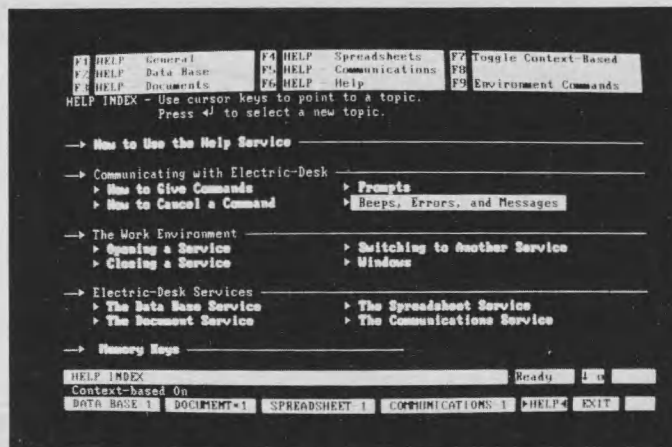


Photo 2. The general help menu. Help for specific applications is available by pressing function keys or by opening context-based help while in an application.

back-up). The program's copy protected and won't boot even after you copy DOS's Command.Com and Mode.Com files to the Alpha Software disk in the installation procedure; you must load DOS, insert the Alpha disk and enter ELECTRIC from the system prompt. It takes about 30 seconds to load.

(Typing ELECTRIC A tells the program to look on drive A: instead of B: for data, but after adding the DOS files, there's not much room there; ELECTRIC.EXE by itself is 185,722 bytes.)

The big box lists Electric Word, Electric Spreadsheet and so on, but Desk refers to its components as document, spreadsheet, database, communications and help services. Perhaps saying "database service" or "document service" raises lower expectations than "database manager" or "word processor."

The screen can get crowded; Electric Desk packs the maximum information into an 80 x 25 display. In each application, the top three screen lines show a menu of the soft function keys F1 through F9 (F10 always returns you to the main level, where you can open another file or leave the program). The next 19 lines are your work screen, which you can split into two nine-line windows with a divider between.

Lines 23 and 24, depending on what you're doing, pack a battery of messages, prompts, spreadsheet cell formulas, the word processor's spaces and tabs ruler, search criteria

(and the number of database records that meet them), i or o to show the insert/overwrite toggle status, and so on.

The spreadsheet is the nicest Electric Desk program. It's easy enough for beginners, with sufficient versatility for serious work.

The bottom line always shows Electric Desk's menu options (the four services, help and exit). To pick a service, you select it from the main menu with the arrow keys and press the enter key or simply type its first letter (such as S for spreadsheet, R for database records). If there isn't a file of that type open, a Y/N answer confirms that you want to enter the application; Alpha's manual claims this step keeps you from allotting precious memory to a service entered by mistake, but it's mostly a nuisance.

Twenty-Nine Things Running at Once

Once you've opened files in different services, switching from one to

another is as easy as pressing F10 (to reach the menu) and then S or R or whatever. Electric Desk recalls open files as you left them with the cursor where you left it. It also remembers the file's window size; one of the "environment commands" available in each service by pressing F9 lets you use a normal screen, a bigger one without the top three lines' soft-key menu or the top or bottom half of a split one.

Bracketing arrows on the menu line show which service you're using; open files in all services are indicated by asterisks (Spreadsheet*1) rather than hyphens (Document-1) in the menu cells.

The numbers are for users who might want to write a report while referring both to a spreadsheet and another word processing document—given sufficient memory, Electric Desk can keep nine documents, nine databases, nine spreadsheets and two communications files open at once. Having used the left and right arrow keys to select Database*1, for example, you use the up and down arrows to choose among numbers two, three and four.

That's terrific, but it quickly takes Electric Desk out of the 256KB range. Working on a compatible with that much memory, I created a medium-sized (30 rows, 18 columns) spreadsheet, then wrote a 30-line letter. When I tried to open a third file, the program complained, "Insufficient memory available."

The same thing kept me from call-

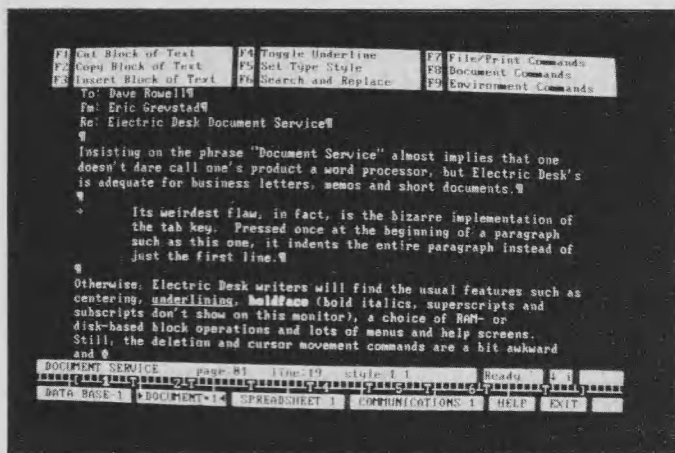


Photo 3. Once again, the function key menu and lower (ruler) lines change to reflect a different service—in this case, the document service.

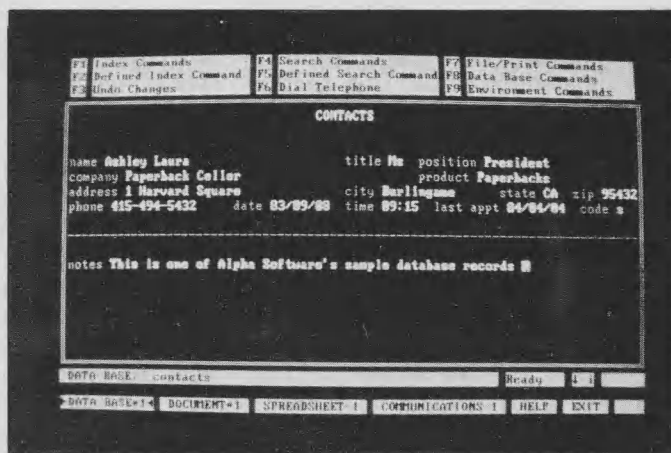


Photo 4. Electric Desk's DBMS makes creating record forms easy. The program finds records by either defined index fields or search criteria entered from the keyboard.

ing for help—F10 and H (plus Y to the Y/N query, particularly annoying when seeking help) open a library of instruction screens, a service in itself rather than part of whatever application you're using. The help service is context-based—unless you request its broadest menu, it opens to a submenu of information about the function you were in last—and quite complete, though checking more than one item involves lots of pushing function keys and waiting for disk access. And, being a separate function, it's not available if your files fill RAM, as mine did.

Odd Tabs, Great Transfers

You might not need the help screens often. Electric Desk's document service or word processor, for instance, is so soft key- and menu-driven that it's hard to make a mistake.

Not that you can mistake it for MultiMate or Microsoft Word. An Electric text can be at most 1000 lines or 32,000 characters long, whichever comes first; the search and replace function doesn't have options like global or whole-words-only replace (you simply order a number of replacements, up to 99), and you have to be careful about searching for exact upper- or lowercase matches. The tab key's function is bizarre and wrong: it indents not just the first but every line of a paragraph until you press the enter key to start a new one.

And some fundamental functions are tacked on as afterthoughts, implemented with the program's macro key ability and noted in a

one-page addendum to the manual. "Delete word" (Alt-D) is merely a mark and delete block operation, using Electric Desk's awkward cursor movement commands (End-right arrow moves forward a word; End-End-right arrow to the right margin). "Move to end of sentence" is a macro-keyed search for a period and "move backward a word" clumsily puts the cursor between words.

The spreadsheet service offers everything most users will want.

Cursor navigation takes some learning, but at least the commands are consistent between services.

There are, however, nice typeset options such as a toggled underline and a choice of plain, italic, bold, bold italic, superscript, subscript and two other typefaces (if your printer can support them; different monitors and graphics boards will have varying success in showing them on screen). Convenient commands allow you to see a file directory or check the amount of space left in a document or on disk, and the service's embedded commands and mail-merge functions, though a little complicated, are powerful

enough for all but the most finicky formats or form letters.

The block delete, copy and move operations, in Electric Desk's easy step-by-step way, are superb. After moving the cursor to the start of a block, pressing F1 to cut or F2 to copy, moving the cursor to the end of the block and pressing the enter key, you have a choice of assigning the block a disk filename or the default filename (Flash), which stores the most recent block in memory for immediate insertion elsewhere.

The same block-defining technique works in a spreadsheet, for example, to specify a group of cells for copying. Electric Desk's greatest strength is that the block buffer known as Flash works across applications. You can define a block of spreadsheet cells, press the enter key to store them, tap F10 and D to switch to an open document, and press the block copy (F3) key to put the cells into your text file at cursor point. It's about as simple as integrated software swapping can be.

A Slick, Sedate Spreadsheet

Speaking of the spreadsheet service, it's possibly the nicest Electric Desk program. Except for being leisurely (all right, it's slow) compared to dedicated spreadsheets—it took about eight seconds to recalculate a dozen numbers in one row and five seconds to clear an empty cell—it's easy enough for beginners, with sufficient versatility for serious work.

The sheet can span up to 255 rows and 255 columns (65,025 cells), identified by row and column number

(r3c4, not D3). Like other calcs, it classifies new cell entries automatically depending on the first character you type—a letter for a label, number for value or formula, or plus sign for a formula.

As you type a formula, the soft keys change, supplying one-key entry for such common functions as Sum or Avg. An even handier short-hand, cell pointing, copies the address of the cursor cell to the formula in progress, letting novices write formulas by moving the cursor rather than painstakingly finding and typing locations.

Besides friendly menu choices for such things as integer, percent, exponential, dollar or fixed-point numbers, there's the ability to scroll a spreadsheet without losing sight of horizontal or vertical titles or to see two distant parts of the sheet at once with windows or viewports. For the money-minded, Electric Desk offers useful formulas, like internal rate of return and net present value, in addition to square roots, exponents and logical operators.

Except for Lotus-like speed, then, the spreadsheet service offers everything most users will want. Cursor navigation, as in the word processor, takes some learning—PgDn to move down one screen, End-End-down arrow to the bottom row—but at least the commands are consistent between services.

Many Records, Many Keystrokes

Until this product appeared, Alpha Software Corp. was best-known for its Data Base Manager II. Electric Desk's database program is no threat to that versatile DBMS, but it's serviceable for moderate filing.

According to the manual, the database service can handle up to 65,000 records per database; each record can have up to 50 fields totaling up to 1000 characters. (Each field can be up to 1000 characters long, if you anticipate a lot of one-field records.)

The service shines at painting or creating forms for your records. The job is as easy as typing on a blank screen and tapping the soft keys to indicate whether you're entering comments, labels or spaces for data in various formats (boldface, underlined, reverse video and so on).

From there, it becomes a little

clumsy. After entering one record, for instance, there's no one-key-stroke way to go on to the next; it's F8 (to enter the database command menu) and the enter key or C (to create a new record).

A helpfully prompted process allows you to specify up to five index fields for sequential sorts or finding known quantities, but the process wipes out instead of updating any earlier index. And, once you're leafing through records, you'll have to see the manual's addendum page to discover PgUp and PgDn, considerably easier alternatives to F1 P (Previous) and F1 N (Next). (The manual does suggest setting the definable key F2 to equal either Get Record, Next or Previous.)

For more complex searches, the database service has fairly sophisticated logical and relational commands (City = Dallas Or Products~[include] Widgets), as long as your criteria fit on an 80-character line. But changing your criteria is a tiresome affair (backspace and type over), as are the separate commands F4 E (Enter criteria) and F4 S (Start search). Also, the PgDn command keeps going even after search matches are exhausted; you can find yourself simply moving alphabetically through irrelevant records while the screen display still lists your criteria.

Communications and Education

If your modem's on-line, one database command dials the phone number of the record on screen. Electric Desk's more formal way to phone, the communications service, requires careful creation and saving of log-in scripts with the word processor. Otherwise, it's a piece of cake—no match for full-powered terminal programs like Crosstalk, but a breeze to use compared to the advanced but somewhat awkward database.

In fact, the communications service uses hardly any soft keys. F2 disconnects your modem, F3 calls a log-in script and F7 and F8 send and receive files respectively; F1 lets you use the cursor keys and a menu bar to choose RS-232C options such as one or two stop bits and none, odd or even parity, with the option of changing the Alpha disk defaults to your specifications.

As with the document service, it's

a good thing that communications are so easy. The Electric Desk manual is fair but alternates between being detailed and skimpy; the communications chapter's sample log-in script has careful annotation for beginners, who'll find general explanations of things like time-delay commands mixed with specific reference to Hayes Smartmodem instructions like AT ("to get the attention of our modem").

I've already mentioned the highly important stuff left for the manual's addendum page. The manual as a whole takes a first-use rather than daily-reference approach, introducing commands and functions in mixed order as you slog through various sample files on the disk; once you're up and running, you'll probably rely on the index and appendixes.

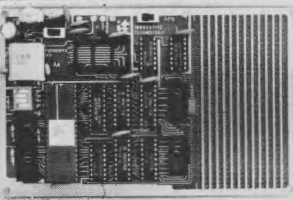
Elementary Integration

Electric Desk doesn't have everything—graphics, in these chart-crazy times, are a glaring omission—and what it does have is sometimes slower and clumsier than I'd like. Still, I find myself feeling charitable about its faults and positive about it generally; my heart is closer to the pfs than dBase school of applications, and true integrated software, as opposed to patchwork windowing, is still new enough that I'm tickled every time I jump from a document into a spreadsheet.

And, as I said at the beginning, the program doesn't really compete with big-league packages like Framework or Symphony. Seen objectively, Electric Desk costs about 45 percent of their price and has 50 to 60 percent of their functionality. Subjectively, the buying audience breaks down into those who need maximum power, those who don't but buy it anyway, and those who don't and are modest enough to admit it and save money. Electric Desk is for the last group. ■

System Requirements: IBM PC or compatibles; 256KB RAM; two disk drives; extra RAM or hard disk optional.

Manufacturer: Alpha Software Corp., 30 B St., Burlington, MA 01803. **Price:** \$345 (128KB PCjr version, \$295).



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A Message from Wayne Green


With the 25th anniversary of my creation of *73 Magazine* coming up in a few months, it seems like a good time to host a small party for Wayne Green alumni. I keep running across people in the various electronic industries who once worked for me.

I want to start a yearly reunion at Comdex. So, if you know anyone who has worked for me during the last 33 years, tell them to get in touch. I'm having some special souvenir coffee mugs made with the logos of all our magazines—a lapse in my usual Yankee thrift approach to life!

The dinner is November 15th in Las Vegas and I'd like every Wayne Green alumnus to be there.

So, alumni, let's get together at Comdex and celebrate! Drop me a note for details. I'm looking forward to seeing you again.

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InteSoft: Innovative Integration

By J. Terry Edwards, PhD, and Deborah L. Edwards

InteSoft, version 1.1

System Requirements: IBM PC, XT or compatible; PC DOS 2.0 or later; 128KB RAM; two double-sided floppy drives; black and white or color monitor; printer.

Manufacturer: Schuchardt Software Systems Inc., 515 Northgate Drive, San Rafael, CA 94903.

Price: InteMate, \$249; InteWord, \$395; InteCalc, \$295; IntePlan, \$195; IntePert, \$249.

All integrated programs are not created equal. Designed with different goals in mind, each package stresses the power and importance of various applications. A package that's good for you may not be suitable for the person across the street. It may have too few or too many features.

Schuchardt Software System's approach with the InteSoft Series contrasts with the popular single-program approach of Lotus and other companies. Rather than selling you several programs (of usually compromised performance) on one or two disks, it offers ten different programs (each with separate documentation) that you integrate as you see fit.

Here we review the five currently available programs in the series: InteMate (series integrator and utilities, \$249), InteWord (word processor, \$395), InteCalc (spreadsheet, \$295), IntePlan (personal time manager and filing system, \$195) and IntePert (Critical Path Method project planner, \$249). The last three are available as a set—the Professional Series III (\$595).

Scheduled for release about now is the InteGraf graphics package. The InteBase relational database manager has a planned release date of spring 1985. Other future releases will include InteVate (an applications generator), InteMail (electronic mail) and Inte3270 (IBM mainframe communications programs).

The InteSoft series runs on either the IBM PC with two double-sided floppy disk drives or the PC or XT with 128KB of RAM, either a monochrome or color monitor and a printer. InteSoft programs require PC DOS 2.0 or later.

InteSoft's Advantage

There are two major advantages to the InteSoft approach. First, all InteSoft programs use common pro-

cedures. Schuchardt Software created a common user interface with similar command procedures and syntax across all programs. The manuals all follow a basic pattern; installation is consistent, and the basic commands are the same throughout. For example, the IBM PC's F1 function key provides access to on-line help, the escape key quits the present function, and Control-Q leaves the program. The use of the cursor keys and many function keys are common throughout all programs. Also, the bottom line of the screen displays the function key assignments, the percentage of free memory available, and the status of the caps lock and number lock keys.

One command key assignment we found annoying is the use of the slash key (/) to begin all command sequences. In order to have a slash appear on your display, you have to type it twice. In some programs—such as InterCalc—this presents little problem because you don't make heavy use of the slash key in that application. But in the word processor, it can be a real irritation. This is a prime example of software design interfacing and forcing you to adapt to it. There are several keys—including

Schuchardt Software's InteSoft Series is a new approach to integrated software. Instead of one or two disks and one set of documentation for several programs, the InteSoft Series features ten programs (we review five here) that are tied together through a common user interface. Each program stands alone, but can be integrated according to your needs.

the backslash (\)—that should be less burdensome to the user.

All InteSoft programs are menu-driven: once you type the slash, all programs display a menu of commands at the bottom of the screen. You can initiate any command either by typing the command's first letter or by moving the cursor over the desired command and pressing the enter key.

The second advantage of the series approach to integrated software is that you buy what you need—nothing more, nothing less. With the single program approach taken by Symphony or Framework, you take the design that someone else conceived and implemented. A program like 1-2-3 includes certain functions and excludes others. If you need something different, you're out of luck. With the series approach, as long as the individual pieces fit your needs, you can assemble a complete package of application programs tailored to your needs.

InteMate

InteMate is the centerpiece of the InteSoft series. It's designed to provide an operating shell that separates you from the operating system when

using common utility functions, such as copying files and formatting disks. InteMate will also provide an interface for the exchange of data between InteSoft programs; make switching from one program to another easier; allow use of two utility programs, Calculator and Scratchpad; and provide a method of customizing screens and menus in InteSoft programs.

InteMate requires a lot of disk swapping when it's installed on a dual floppy drive system. However, the instructions are clear and specific and, as long as you follow them explicitly, you'll have no difficulty. The master disk has batch files for the installation of InteMate on both hard disk and dual floppy systems. If you're using a floppy disk system, be sure to type the volume labels precisely as stated in the manual. Otherwise, InteMate won't recognize the disk when you begin swapping one for another.

When booted, InteMate presents you with a menu of InteSoft programs. A secondary menu lists the utility programs, the editor and up to three programs of your choice that aren't a part of the InteSoft series. You indicate your choice by positioning the cursor over the program you want and pressing the enter key.

Prompt Prompts

When you choose an application on a floppy disk system, InteMate prompts you through the appropriate disk swapping. InteMate displays an alphabetically sorted and indexed list of the files on the application's data disk. This list cannot be accessed from any other InteSoft application. (You can, however, produce a simple listing of files from the other applications.) You can type a descriptive name of up to 36 characters in the indexed listing. This display also shows the origin of each file.

The DOS utilities that can be accessed directly from within InteMate are Copy, Delete, Rename and Format. They all execute properly. You're prompted through the actions necessary to complete the DOS activity.

InteMate has two utility programs—Calculator and Scratchpad—that provide simple computation and editing capabilities. These are unique InteMate activities not found in other InteSoft programs. A nice feature of the calculator function is the ability to record formulas. Output from Calculator and Scratchpad can be routed to other applications.

The ability to move data from one

```

--> Page 1 Line 34 Col 1 Change SET BLOCK
{
Boston, MA -- InteSoft, the first complete and totally integrated office automat
product family in the world, was introduced today by Schuchardt Software Systems
a special press conference at the Westin Copley Place.}
{
According to Frederick Schuchardt, President and founder of the six-month-old so
publishing and marketing company, InteSoft will redirect and lead the way small-
sized businesses operate.}
{
InteSoft represents the new generation of business applications software. It
enables you the first time, to easily automate business functions with
InteSoft's integrated systems.}
{
Conceived and developed by San Rafael-based Schuchardt Software Systems, Inc., t
Series is designed for the IBM Personal Computer and compatible systems.}
{
-----
Currently consisting of seven products, the InteSoft line includes:}
{
INTECALC: One of the most powerful, easy-to-use microcomputer spreadsheet prog
{
-----
1Set 30Test 5Find 7Format 9Lex 2Clear 4Line 6Screen 8Page 10Docmt

```

Screen from Schuchardt Software Systems' InteWord full-featured word processor. Capabilities include merging data files with form letters, column alignments and a bank of up to 36 macro phrases. The two top screen lines display important status information. The bottom line lists function key actions.

application into another is a significant InteMate function. Any application's data file can be transferred to any other application, the calculator, the scratchpad or the system printer. A WordStar file can be translated into an InteWord or ASCII file, a DIF file can be translated into an InteCalc file or ASCII file and a Lotus 1-2-3 spreadsheet file can be translated into an InteCalc or ASCII file. The procedure for translating WordStar files into InteWord format uses a special utility program—Convert. In short, these are flexible file transfer procedures.

Powerful Capability

InteMate's editor can modify any InteSoft screen or menu as well as create new screens and menus. For example, the main InteMate menu lists all of the present and projected InteSoft offerings. With the editor, you can eliminate the ones you're not using. You can also modify the second main menu to display the titles of your own non-InteSoft software.

You can create custom screens and link programs through a system of menus so that they execute on cue. Of course, this capability has its limits. You cannot execute DOS batch files, only COM or EXE files. Still, this cus-

tomizing feature adds a significant degree of flexibility to the series. Along with the data transfer facility, it's probably the main reason to buy InteMate.

InteWord

InteWord is a full-featured word processing program. InteWord not only provides most of the features of word processors like WordStar and MultiMate, it adds a few of its own.

Like the other InteSoft programs, InteWord is easily installed on the IBM PC. A variety of printer drivers are included on the master disk. At print time, you're allowed to select a different printer from the one that was installed. This lets you use a dot-matrix printer in draft mode, then switch to correspondence mode or to a letter-quality printer for your final printing. We tested the installation procedure—a program called Tailor that's run from DOS—and found it worked perfectly.

Supports Special Style

Several features give InteWord enhanced flexibility and utility in comparison with other word processing

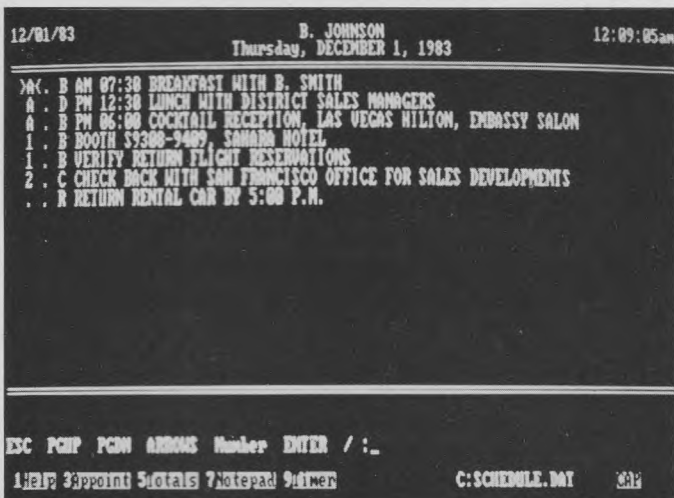
InteCalc File Index				Tuesday Nov. 1, 1983	8:38 AM
Filename	Size	Date	Title	Origin	
ACCOUNTS	128	1-01-80	<<Create new InteCalc file.>> Accounts receivable data base	InteBase	
GRAPH	2816	9-23-83	This is a graph of accounts receiv.	InteCalc	
INCOME.BUD	17152	10-03-83	Family income accounting sheet (tem)	InteCalc	
INCOME.EX	128	9-23-83		InteCalc	
MSF	7424	9-29-83	Monthly sales forecast (tem)	InteCalc	
PRESSREL.WP	3456	1-01-80		InteWord	
PROFITS2	4608	12-27-82	Profits (graphs + InteWord) (tem)	InteCalc	
PROFITS2.TEM	45	9-17-83		InteCalc	
ROCKWELL	30208	1-01-80	Rockwell Scenario (tem)	InteCalc	
ROCKWELL.EX	9728	1-01-80	Rockwell Scenario (demo)	InteCalc	
ROCKWELL.TEM	128	9-17-83	Rockwell template	InteCalc	
ROLODEX.DAT	128	1-01-80	Sales leads for previous quarter	IntePlan	
RUN	896	9-23-83	RUNNING DEMO TEMP	InteCalc	
RUNDEMO.EX	896	9-25-83	The Runner's Log (exec)	InteCalc	
AMORT	1715	1-01-80	Amortization schedule	InteCalc	
ET	768	6-17-83	Effective interest rate	InteCalc	
FV	1152	6-17-83	Future value	InteCalc	
1Set 2Clear 3Menu 4Edit 7Print 10Quit					

File index of InteCalc, a three-dimensional spreadsheet that integrates with other programs from SSS's InteSoft series.

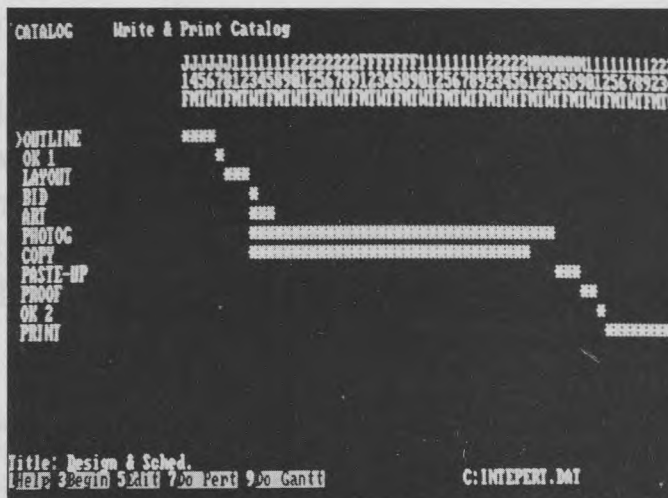
programs. Like virtually all word processors, InteWord supports word wrap. It also supports a special style of justification called semijustification. This style is in between normal justification, with its ragged right margins, and justified where the right margin is flush but a lot of white space appears in between words (when the document is printed without proportional spacing). Semijustification reduces the right margin's raggedness and, therefore, improves the appearance of the printed document. InteWord also supports true proportional spacing.

With InteWord, you can also type a document directly to a printer. In essence, the computer becomes a keyboard for the printer. If you make a mistake, you're either out of luck or reaching for the correcting tape. However, the software also lets you type and edit a document and then send it directly to the printer without saving it. This is handy for dashing off memos or quick notes that you don't need to save.

InteWord is page-oriented. Consequently, you can go to any page in a document at any time. InteWord also permits you to scroll by page as well as by screen. You can jump to any



IntePlan's Agenda feature can produce daily or monthly calendars.



IntePert requires no previous math or critical path skills to produce critical path time lines or Gantt charts of a project.

line number within a page. If you're using a program like WordStar (which automatically paginates), this orientation takes a bit of adjustment to get used to. Mostly, you need to remember to repaginate after making any changes that affect page length. It's a simple and quick procedure.

Three Unusual Features

Three InteWord features aren't found in most word processors. One is a merge facility that lets you merge data files with form letters, having the operator fill in variables, insert files and set values within the merge function itself. When this last feature is combined with conditional (if...then) statements, the program's capabilities approach a programming language.

Second is a column alignment capability. With a simple command (/.) you tell InteWord to start column alignment, which it'll do at the next tab stop.

The final capability is the phrase bank, which lets you store up to 36 phrases. Any one can be retrieved and inserted into a document at the cursor position at any time.

When you run InteWord, it presents a text entry screen. The top two lines convey status and format infor-

mation. The status line displays the page, column and line number of the cursor's position, as well as the typing mode (change or insert). Apparently, InteWord assumes that you're in the change mode when commands are executed. We experienced unexpected results when attempting to execute commands in the insert mode.

The format line displays the style of justification in use, the width of the formatted line and the tab stop locations. You can change all default settings easily.

The bottom screen line displays the function key assignments, the name of the file (if you're editing an existing file), the percentage of memory remaining and the status of the caps lock and number lock keys.

As experienced MultiMate and WordStar users, we found InteWord easy to learn and use. We like the command entry procedure—except for the use of the slash key. We have no hesitancy in recommending that you give InteWord a try.

InteCalc

InteCalc is Schuchardt Software Systems' entry into the spreadsheet field. Its most unique feature is that it

has three dimensions. Not only do you have rows and columns, you have pages, too. With a total potential of 16,581,375 cells, an InteCalc spreadsheet can certainly be big—too big, in fact, to fit into the 640KB maximum RAM of the IBM PC. However, the space really is there to give you flexibility in designing and running a spreadsheet model.

Installing InteCalc is straightforward: simply copy it onto a formatted system disk. Several sample spreadsheet files will help you to learn InteCalc, as will the tutorial included with the manual.

Special Functions

Several InteCalc functions allow you to customize a spreadsheet to your own needs. You can center the headings on the displayed portion of the spreadsheet and, as with other spreadsheets, you can suppress the border on the sheet and modify the column widths.

InteCalc provides the normal cell-control features, including protection, floating dollar sign and embedded commas in numbers. It also has the capability of naming cells and using the names in formulas instead of the cell location. There's also a command that

This series clearly represents a significant investment in time, energy and money. Most importantly, all of the available programs are worthy of evaluation and use—each program is designed to be used in real offices by real people.

lets you change a cell back to its default setting.

You can view a spreadsheet from any of InteCalc's three dimensions. The normal viewing perspective is the page perspective: that is, as if you are looking down on a sheet of paper on a desk. But you can also invoke a row or column perspective.

Imagine that your display screen is an account ledger. You see the first page, January, with Planned, Actual and Variance as column headings. The chart of accounts is listed down the right side of the page in the rows. Now suppose that you want to look at the actual figures for all months. Simply give the appropriate command and you'll be in the column perspective. If you want to look at the variance between planned and actual expenses for utilities, go into the row perspective. You can view planned and actual utility expenses for each month.

This is a powerful capability. The idea of a small-business accounting system is a good illustration (and was suggested to us by Allen Mirviss of the Schuchardt technical support staff). Unfortunately, the manual neither suggests uses for this capability nor gives any examples. None of the sample spreadsheets is three-dimensional, either.

InteCalc contains a complete set of graphics characters. These can be used on a spreadsheet or printed, if your printer is capable of doing so.

There are two kinds of cell entries in InteCalc: text and numeric. In turn, there are two kinds of numeric entries: numbers and formulas. If the first character is a semicolon, an open parenthesis, a period, a minus sign,

an equals sign or a number, InteCalc assumes the entry is numeric. If the entry is anything else, InteCalc assumes the entry is text.

The global controls available in InteCalc are more flexible than those available in many spreadsheets. You can sort by row, column or page; you can do a keyword search; and you can delay recalculation.

InteCalc's 26 functions allow you to do date, financial and statistical calculations.

Impressive Capability

In addition to its three dimensions, one of the impressive capabilities of InteCalc is the Exec function. Exec is a miniprogramming capability that allows spreadsheets to become interactive. The InteCalc disk comes with several Exec files, including net present value and linear regression. Fortunately, the manual covers this powerful feature more thoroughly than it does the three-dimensional aspects of InteCalc.

All in all, InteCalc is a fine spreadsheet. It's a happy conjunction of ease of use, on the one hand, with power and flexibility on the other hand. When its three dimensions are combined with the capability of Exec, InteCalc can be used in a wider range of applications than the standard spreadsheet. It should be particularly well-suited to small-business accounting and financial management.

IntePlan

IntePlan is a program for personalized record keeping. Actually, it's two programs: Agenda and Records.

The former provides monthly and daily calendars, a notepad and an account pad. The latter is a personalized record manager. The IntePlan manual has separate tutorials for each program.

Within Agenda, daily and monthly calendars are tied together and used to keep track of dated information, such as appointments, phone calls, expenses, reminders and notes.

You can enter information in five ways. An entry identified as an appointment is listed at the top of the screen. Appointments are followed on screen by entries tagged as priority 1 and 2, respectively. Finally, entries classified as a note or as a to-do list are listed last among a day's entries. Entries for any day—past, present or future—can be made at any time.

Any entry, regardless of type, can be categorized as meeting, telephone, personal and so on. There are a total of 26 possible codes.

At any time, you may search your entries by entry type, category or keyword. Thus, you can generate a report across all calendars on a chosen keyword.

What's on Agenda?

The Agenda notepad is a simple note processor that allows you to make quick entries on any topic that's pertinent at the moment. You can even set a buzzer to time activities. You can also create different types of specialized notepads on subjects of personal importance, such as addresses, notes and customer contacts. IntePlan provides a flexible and, therefore, powerful way of tracking time- and date-related information.

It was a bold move to introduce a PERT and CPM program prior to the introduction of graphics and database management programs. Of course, only time will tell if it was the right move.

The Agenda account pad can be used for personalized accounting chores like balancing a checkbook, keeping track of expenses or calculating fees. This feature is handy for tracking money spent in particular ways, such as on clients or projects. You can create special account pads for accounts receivable, invoices or whatever category you like. All entries can be timed and dated.

IntePlan's Record program is a flexible means of keeping track of categories of information like employees, clients and vendors. The program comes with a completely set-up file. However, you have the option of setting up your own.

There are four levels of records: general, detailed, project and resume. The general level of data lists all the records on the data disk, while the detailed level presents one record at a time. Thus, you search the general level for the record you want and then view it in the detailed level. The format of the general and detailed levels can be customized.

The project and resume levels are intended to be specifically for project and personnel data. Their format is fixed. The project level tracks the projects of individuals, giving the planned and actual starting and ending dates and a brief comment. This information can be shared with IntePert. The first nine fields may be used for ordering records, and sort order may be keyed to any two of those fields.

IntePert

IntePert is a program that implements the Program Evaluation and Review Technique (PERT). Along with

IntePlan, IntePert is designed to be a managerial productivity tool. Based on the Critical Path Method (CPM), a mathematical procedure, Pert is a project planning tool. Its primary claim to usefulness is its ability to interrelate project resources and task completion times. The program makes no assumption that you have any knowledge of the critical path method or any mathematical skills beyond addition and subtraction.

You're expected to tell IntePert the project's name and its tasks and subtasks. Each task and subtask is given a title, resources and an estimated duration. Think of a project as an inverted tree. Its main trunk (the project title) is at the top; the main branches (the subtasks) spread out from the trunk. In this way, a complex project design may be built up with as many as 64 task levels.

Output Plans

IntePert's output is a plan that can be expressed in several ways. One is a time line that shows the critical path—the shortest time to project completion. The time relationship of all project tasks and subtasks is shown. You're told if a critical path can't be constructed with the times or durations given. You can edit task descriptions and attempt a new model. The critical path shows the tasks that are essential to the timely completion of a project and the resources they consume.

Another product is a Gantt chart, a graphic time line of tasks. You have a choice of either horizontal or vertical display. IntePert can also provide data on resource usage (as opposed to time). For example, reports are avail-

able on each type of resource.

It may be useful to think of Pert as a specialized kind of database manager, one that's concerned with the time and resources necessary to complete a project. IntePert does a good job of implementing the critical path method. While it's relatively easy to use, it also demands that a good deal of thought go into the identification of project tasks, the resources they need and the time necessary to complete them, before you run the program.

IntePert is a program that should help move PERT and CPM out of the operations research closet and into the mainstream of workaday management. IntePert is definitely a worthy member of the InteSoft series. It was a bold marketing move on Schuchardt Software's part to introduce a PERT and CPM program prior to the introduction of the graphics and database management programs. Of course, only time will tell if it was the right move.

These five programs—InteMate, InteWord, InteCalc, IntePlan and IntePert—make up the InteSoft series of integrated software from Schuchardt Software Systems. This series clearly represents a significant investment in time, energy and money. Most importantly, however, all of the available programs are worthy of evaluation and use. Clearly, each program is designed to be used in real offices by real people. ■

Address correspondence to the authors at Center for Computer Solutions, 12841 SW 80th Ave., Miami, FL 33156.

SOFTWARE REVIEWS

PC Draw: Test Your Wings at CAD

System Requirements: IBM PC, XT or compatible; 128KB; two disk drives; color graphics card; printer or plotter; a light pen is optional.

Manufacturer: Micrografx Inc., 1701 N. Greenville, Suite 305, Richardson, TX 75081.

Price: \$395.

Graphics software is one of the hottest selling products available for microcomputers today. Most programs are advertised as providing either analytical or presentation graphics, but one package really stands apart from the crowd: PC-Draw. This program lets you use your IBM PC as an inexpensive computer-aided design (CAD) system. I wondered just how useful the \$395 PC-Draw could be, since most CAD software costs more than \$1000. However, I found PC-Draw to be a comprehensive and flexible drawing program for the PC—I was equally pleased to discover it supports a light pen.

Written in compiled Basic, PC-Draw isn't a particularly stunning program. It uses no esoteric languages or fancy screen handlers. The speed of the program is acceptable, however, and the extensive Basic graphics set of the IBM PC is ideal for this type of drawing program. Consistent with the resolution provided by Microsoft Basic, PC-Draw provides for either high-resolution black and white drawing or medium-resolution color drawing.

PC-Draw uses templates to speed the drawing chores. Three templates come with the program: a flowcharting template, an office layout template and an electrical design template. If these don't suit your needs, you can easily create your own templates. Sample drawings in the program and

the manual illustrate the flexibility of PC-Draw. They include printed circuit design, office floor plan layout, home floor plan layout and the inevitable organizational chart.

Getting Used to Things

It takes some time to learn how PC-Draw uses the IBM keyboard. You use function keys to make some selections, and a series of alternate and control/alphabetic key combinations adds to the confusion. The alternate key also works with the function keys to add selections to the function keyboard. The result is a hodgepodge of keys that you must either remember or take notes on.

Templates and keyboard overlays aren't provided with the program and there's no single list of key assignments in the manual. A reference card is provided, however, which offers a complete listing of the key functions. I expect most people will keep it handy for a while. I found the key assignments confusing until I felt more familiar with the program.

Speaking of the manual, it's the weakest part of this program. There's no index. The table of contents tries to make up for the lack of an index by being complete, but it just can't replace a well-organized index.

The best approach is to sit down and read the manual from beginning to end. Be prepared to take notes—the manual explains many of the key combinations in odd places, and you'll have trouble finding them again without an index. Of necessity, the reference card doesn't cover the complete details of all the keys, but it's better than most. It does have brief descriptions of each key's function and references to page num-

bers in the manual for each subject covered.

PC-Draw is copy protected. You must have PC-Draw Disk #1 or #2 in drive A whenever you use this program, even if you have a fixed disk. As soon as you start the program, you can remove the PC-Draw disk and use the hard drive until you exit the program.

PC-Draw uses a key-type system of copy protection. Without one of the two system disks, the program won't boot and a system level error occurs, forcing you to do a system reset. If a program disk fails, Micrografx has a \$10 replacement fee. Given today's inflated market prices for replacement disks, this is a generous replacement offer.

Name Calling in the Main Menu

Once PC-Draw is up and operating on your system, it presents you with a menu of possible selections. The main menu consists of eight options, including create or print a drawing, create or update a template, and some utilities. There is also an information choice that, if you select it, instructs you to place the second program disk in the drive so it can read the general help files for PC-Draw. The manual suggests that you use the program tutorial provided to familiarize yourself with the system. I heartily endorse the recommended tutorial since trying to find your way around PC-Draw without it can be frustrating.

Drawing with PC-Draw requires several menu selections and some name calling. First, you select the create or modify choice on the main menu. PC-Draw asks you to name the drawing. If you've already created a drawing and want to modify it, enter its name.

to make them fit better on your paper.

Neat Little Program

I've used PC-Draw for almost a month and have found that it lives up to its claims for ease of use and versatility. It works well with the Hewlett-Packard 7475A plotter and the Epson MX-100 printer I have in the office. It also works well on both color and monochrome monitors.

PC-Draw is one of those neat little programs that I'm not really sure you need. If you have a lot of detailed drawing to do and you make a living at it, you probably already have access to a computer-aided design program and a mainframe computer. If, however,

you spend most of your time doing other work and occasionally have to do a flowchart or a diagram, then PC-Draw may be worth the expenditure, especially if the drawings you create aren't included in graphics programs already available to you.

Perhaps PC-Draw's greatest strength is that it lets you move beyond the stock organizational flowcharts into more creative design areas with your microcomputer. If you want to get a taste of what computer-aided design is all about, PC-Draw offers a relatively inexpensive way to test your wings as a graphics designer.

Shawn Bryan
Montpelier, VT

CONCEPTUAL OVERVIEW

```
graph TD;
    KeyTape((KEY TAPE)) --> InputEdit[INPUT EDIT];
    ManualEntry{{MANUAL ENTRY}} <--> OnLinePosting[ON-LINE POSTING];
    OnLinePosting --> TransMaster((TRANS MASTER));
    InputEdit --> TransMaster;
    InputEdit --> ControlReport{{CONTROL REPORT}};
    TransMaster --> PurgeHistory[PURGE TO HISTORY];
    TransMaster --> DatabaseCompare[DATABASE COMPARE];
    PurgeHistory --> TransOutput[TRANS];
    DatabaseCompare --> NoMatch[NO MATCH];
    DatabaseCompare --> Database[DATABASE];
    Database --> DatabaseMaster[DATABASE MASTER];
    DatabaseMaster --> LineDatabase[LINE DATABASE];
    DatabaseMaster --> RevenueMaster[REVENUE MASTER];
    DatabaseMaster --> NonCashMaster[NON-CASH MASTER];
    DatabaseMaster --> DBMaintenance{{DATABASE MAINTENANCE}};
    DBMaintenance --> LineDatabase;
    DBMaintenance --> RevenueMaster;
    DBMaintenance --> NonCashMaster;
```

TRANS / DAILY / NO MATCH / DATABASE

DRAFTING

EXECUTIVE

MANAGEMENT

RECEPTION

COMPUTER ROOM

ADMINISTRATION

CONFERENCE

DESIGN

3270

X T

WP

PC

CU

IBM 4341

P

3270

OFFICE LAYOUT WITH NETWORK CONFIGURATION

Fig. 1. Examples of floor plan and organizational charts plotted with PC-Draw.

SideKick vs The Desk Organizer

SideKick

System Requirements: IBM PC, XT, jr or compatible; 64KB; one disk drive.

Manufacturer: Borland International Inc., 4113 Scotts Valley Drive, Scotts Valley, CA 95066.

Price: \$49.95.

The Desk Organizer

System Requirements: IBM PC; 128KB; 80-column display; two disk drives.

Manufacturer: Warner Software Inc., The Desk Organizer, 666 Fifth Ave., New York, NY 10103.

Price: \$295.

You're typing a table with your word processor and need a quick total. Or you're finagling figures on a spreadsheet and the phone rings. A quick switch to an on-screen calculator for some arithmetic, or to an electronic appointment calendar to set a date, and you're back to where you left off in your application.

SideKick and The Desk Organizer both fit neatly into this scenario. Each program offers electronic substitutes for real desktop items—calendar, notepad, calculator and phone dialer. Each partitions your PC's memory to allow you to run a second application program. But hang on—the two programs aren't identical.

Desk Organizer has a clock/alarm and a filing system; it's best suited for people who make appointments and phone calls a good part of their workday. SideKick includes a built-in ASCII table and the ability to import data from the display of your second application; it's best for people who spend most of the day at the keyboard and use the phone or make appointments less often.

SideKick offers fewer options and features, but it's one-sixth the price and uses half the memory

required by Desk Organizer. Surprisingly, SideKick outperforms its high-powered cousin in some aspects. It's important to keep in mind that these programs, although similar, are targeted toward two different types of user.

Desk Organizer Rules Your RAM

Desk Organizer fills a 128KB system. If you have more memory, you can use its meta function to run a second application while Desk Organizer stays in the background, monitoring your appointments. According to Warner Software, Desk Organizer works with Lotus 1-2-3, WordStar, VisiCalc, dBase II and the pfs series, among others. Desk Organizer won't share your PC with programs that disable the break key.

Pressing Control-break switches you between Desk Organizer and your other application, always returning you to where you left off. But it's not something you'll want to do constantly, because disks have to be switched. Both Desk Organizer disks must be inserted for the program to work, and both disks are protected, so DOS won't touch them. Its size, design and functions demand that Desk Organizer be your primary PC application.

In Use

Desk Organizer is based on a file system. Data volumes (one disk side) are divided into indexes that group related notes together. Each note (limited to 2500 characters) is named with a label.

Desk Organizer divides the screen into set functional areas: the time in one corner, a list of the indexes on the data disk to the left and a catalog of the note labels in the current index to the right. The notepad, where you

display or edit the note belonging to the current label, occupies the lower half of the screen. Two lines at the top of the display list currently available commands. After periods of disuse, the display clears (except for the time) to prevent phosphor burn-in; any keypress will bring it back.

Left and right arrows cycle you through the index selection. Once an index is selected, the up and down arrows and page keys move you through its label list. In long lists, the Jump command takes you to the entry closest in alphabetical order to the letter or word you've entered. Pressing R (recall) displays the note indicated by the highlighted label. The note can then be edited or deleted.

With single keystrokes, you can cross-reference a note with additional labels, file a new note, blank out the notepad, initiate a phone call or print a note, to name but a few possibilities. Most commands have options you can set. To bring up a menu of options for a particular command, you press the alternate key while pressing the key for that command.

Organizer Options

The flexibility afforded by the many command options helps justify the price and size of Desk Organizer. You can set the program to request verification for potentially destructive commands (e.g., clear the notepad) or to sound the clock chimes on the hour. You can opt to have trig functions on the notepad evaluated in degrees or radians, set margins and line spacing for the HardCopy command or provide the local area code that can be ignored by the phone dialer. A powerful option of the meta command diverts printer output from the other program sharing RAM to a Desk Organizer notepad.

Along with its filing system, the alarm function puts Desk Organizer in a different category from SideKick. You can monitor up to 100 notes filed as appointments. The alarm (visual, audible or both) tells you when your time has come. You can configure the

alarm to monitor other indexes but only one at a time.

The Desk Organizer tutorial data disk comes with several sample indexes showing how to set up an appointment file, a phone directory for the dialer and a "to do" list. You can adapt the disk to your own uses. Other indexes provide information you may want to keep: help files, business calculations, control codes for common printers, U.S. area codes, form letter blanks, metric conversions and even zodiac birth dates.

Faithful SideKick

Window-oriented SideKick is more modest than Desk Organizer. It's essentially a set of useful tools waiting behind your application or DOS. Its compact size resident in memory (thus free of frequent disk I/O) and its ability to write note files to any disk mean that SideKick is never more than several keystrokes away.

Press Alt-Ctrl and the SideKick menu window is there. Press it again and you're back to programming or whatever, always where you left off. If memory is scarce, there are three smaller SideKick versions with one or more functions removed. The smallest (calculator and ASCII table only) leaves 90KB in a 128KB machine.

Each SideKick tool is a window that can be towed around the screen with the arrow keys. The notepad window can be enlarged to fill the screen or shrunk to half a line. You can cover the screen with different windows, if that's useful to you, with your application showing through in the background. Two keystrokes activate any window, bringing it to the foreground; pressing the escape key closes the current window.

SideKick's most interesting feature is its ability to pull ASCII data right off the screen of a second application. You jump from a spreadsheet display, for example, to the SideKick notepad and invoke the import function. The spreadsheet reappears with a cursor, which you can use to define

a block. Once defined, the block of characters is copied to the notepad. I was able to copy whole screens to a file and then recreate the screen with the DOS Type command.

Several SideKick features will benefit programmers. The ASCII table shows all PC characters, including graphics, as they appear on screen, along with decimal and hexadecimal codes and any mnemonics. The SideKick calculator can convert numbers between decimal, hexadecimal and binary, and it performs logical operations (And, Or and XOR) in all modes.

Comparing Tools

Both packages have adequate manuals and on-screen help. Desk Organizer is more complete in this department. A professionally printed three-ring binder contains a briefing section (a removable booklet) to get you started quickly with a whole range of functions, a section of progressing tutorials and a reference section.

There's also an index and an empty section for the free "New Tools" quarterly newsletter. (You're also promised free updated versions for one year.) Desk Organizer has extensive on-screen documentation that can be called up at several levels, depending on the function you're using.

The SideKick manual is a 73-page paperback with a quick starter section to get you going with all functions. Individual sections on each of the tools follow. There is an index and sections on installation and use suggestions.

SideKick provides a help window at the general level and glossary-like screens within each function, but the help extends no further. The notepad shows the command for search and replace but doesn't give you the options for the command, for instance.

SideKick, with its WordStar-like notepad, far outshines Desk Organizer and its primitive text handling capabilities. The WordStar editing keys are augmented with good use of the PC cursor keypad. The more exotic WordStar functions are missing, but SideKick provides the search-and-re-

place and block functions. Two valuable additions are the Print Block and Sort Block commands.

The installation process lets you custom configure which keys control which functions; you can also set the size of the notepad from 1000 to 50,000 characters. SideKick will read any ASCII text.

Desk Organizer fills 128KB and costs \$295, yet its text handling abilities are a shame. You can cut and paste, insert printer control codes and import blocks from other notes, but the cursor control rivals primitive screen editors and text is limited to 2500 characters. The notepad is Desk Organizer's one major fault.

Time Will Tell

Both programs display monthly calendars and schedule appointments. The cursor keypad moves you by day, week or month, or you can jump directly to any date (to the 99th century with Desk Organizer). Both will also print schedules for any length of time. SideKick displays an actual appointment book with half-hour slots. Desk Organizer lists all appointments by date in the appointment file, each with its own note.

Desk Organizer has the advantage here because its alarm system monitors your appointments. Both packages let you "stamp" the current system time and date into notes, which is useful for daily logs. With either system, you'll want to invest in a clock board so you won't have to bother setting time and date.

SideKick's on-screen calculator is more powerful with its hex, binary and logical capabilities, and the ability to accept nested parenthetical expressions. Desk Organizer, however, supplements its simple four-function calculator with the power to evaluate algebraic expressions in its notepad area, including trig functions. You can build a library of often-used math expressions. It also has a "paper tape" option that displays all calculator entries.

The SideKick calculator has one unfriendly aspect. Leading zeroes are automatically truncated, even

in binary mode. Imagine entering 0000 in binary and seeing 0.00 on the screen. You'll have to be pretty sure of your accuracy to do much binary arithmetic. Parentheses don't show on the screen either, making nested expressions too risky to try.

There is more similarity in the phone dialers. Both will pick and dial numbers off the screen of another application program, which is nice, but both support only Hayes-compatible modems. (Warner does promise future support of other types and lists a number to call for help.)

Desk Organizer again goes beyond its smaller cousin by offer-

ing features necessary for business use: settable dialing pauses, default prefixes to get an outside line and the ability to ignore the local area code. This again reflects the differing philosophies of the two programs.

This is not really a David and Goliath contest, although SideKick packs a mean slingshot. Both programs can be useful, but they were definitely designed for different markets. I picture a programmer working at home as the perfect customer for SideKick, and perhaps a sales manager using Desk Organizer.

David Rowell
MC Staff

Communications: Write Away

System Requirements: Apple II, II Plus, IIe or IIc; 64KB; one disk drive; a printer, modem and 80-column card are recommended.

Manufacturer: Midwest Software Associates Inc., 1160 Appleseed Lane, St. Louis, MO 63132.

Price: \$175.

The name Write Away should be familiar since this Apple II word processor has been around for several years. But now author Doug Stinson and publisher Midwest Software have released a new version (5.3) that updates, improves and adds a terminal package to an already sophisticated program. It's about time somebody integrated a decent word processor with a good communications program. Write Away fills the void—in all the right ways.

The Edit, Format and Terminal modules comprise Write Away's integrated program. Edit resides in memory at all times; Format or Terminal are called as needed. Having only two of the modules memory resident is probably all that's necessary for 95 percent of your work, but switching from word processing to communica-

tions, or vice-versa, is swift, since a proprietary fast DOS is used to speed disk access. While switching, your document remains in memory.

The Word Processor

Write Away retains the dot command structure popular with many word processors. A period at the beginning of a line indicates that a formatting command will follow. Dot commands can be strung on the same line so they become relatively unobtrusive in your text. A NoFill or Fill command instructs Write Away to leave it as typed or format as directed by the dots.

Editing commands are extensive. Photo 1 shows the help screen displaying most, but not all, the edit commands. Formatting commands are equally numerous. Everything you'd expect is included: margins, justification, headers, footers, centering, page numbering and tab stops, as well as some you wouldn't expect, such as begin, repeat, fill characters and increment. Format is called to print or display your document, but editing cannot be

accomplished within Format.

Macros, local or global, are defined using any of Write Away's commands, and eight function keys can be programmed and saved as a set for later recall. These are used by typing a Ctrl-Q and a number (1-8), or an Apple key and a number on the IIe and IIc. You may have as many function key sets as you have keys on your keyboard, so it's possible to customize the function keys for the particular type of document or phase of editing in which you're engaged, and then call them as needed.

A definable transparency character can be used to enter comments into your document that won't appear in the final draft but will remain for reference in your source file. This same character is used to send control or escape characters to the printer. A ".send" command is also available to send any ASCII code to the printer. A multitude of printer drivers is provided for all the popular models, or you can write your own driver and incorporate it into the program. IIc owners will find Write Away remembers the serial port configuration. I can't think of any feature of any printer with which Write Away will fail to operate.

Soft hyphens can be entered into longer words as you type. With justified formatting, they'll be line-end hyphenated accordingly. In the middle of a line, they're ignored.

Extensive form letter development is possible with unique ".call," ".get" and ".define" commands. A Call command can be used to link any other files when printing. For example, a short master file could call numerous other paragraphs, chapters or documents. Although Write Away has a relatively large (27KB) buffer, with this feature your continuous printing abilities become limited only by the storage capacity of the disk drives. An additional 4KB cut-and-paste buffer functions similarly to AppleWorks' clipboard.

A Get command will cause Write Away to pause, provide a

Function Key Definitions

F1 = Write Away

F2 = mgWrite Away\$ = cWrite Away\$\$

F3 = 65ef\$\$

F4 = \^:I\

F5 = \^B\d

Here is a display of a portion of the function key menu. You call a key's contents by typing Control-Q and then the numeral 1-8 (on the Iie and Iic, an Apple key and the numeral). The dollar sign represents an escape keypress and appears in inverse video on the screen.

F1 writes the words "Write Away"

F2 defines a macro command to find (Get) the words "Write Away" and change them to "Write Away."

F3 reformats the screen to 65 columns.

F4 sends Escape-I characters to the printer.

F5 sends a Control-B and then the F4 key commands to the printer.

Table 1. Write Away's function key definitions.

written prompt and await your input. A form letter, for instance, could ask for name, address and state and then place your inputs within the document wherever specified. Photo 2 shows a file using the get and call prompts.

The Define command extends this user input feature tremendously. Pseudoprogramming features of if...then...else become possible based on the Get response. If a Get input was "Mr." for example, a Define command would provide "him" or would print the appropriate alternative.

```

get 1:First name
get 2:Last name
get 3:Street address
get 4:City
get 5:State
nf para 0.1.5.1w 50.rw72
c:May 10, 1982
sk2 .1w0
?1 ?2
?3
?4, ?5
Dear ?1,
sk .f
In this age of automation, isn't it comforting to know that some
of us still have the consideration to take the time to write a personal
letter to an individual? ?1, I just want to reassure you
that it is our intent to remain on a personal basis. Whenever anyone
mentions ?4, the name of ?1 ?2 always comes to mind.
call:Paragraph1

```

Photo 2. A Write Away file using Get and Call prompts.

```

Write Away          s/n 940752
-----
#A Advance lines  #W Wrap column
#B Beginning      #X$ exchange (K+I)
#C Change         #Z define ^Z key
#D Delete         EC Catalog
#G$ Get text      ED$ Delete file
#H Help          #EF re-format text
#I Insert         EK Key click
#J Jump pointer   #EM Execute Macro
#K Kill lines     #ER$ Read file
#L List lines     ES Show macro
#M define Macro   EW$ Write file
#O Origin of line (<) delete text
#R Record length +; insert
#S Save lines    0 do macro
#T Take macro    $* mark position
#U Uncave text  : cut and paste
#V Verify lines  # change case

Press CTRL-X or SPACE bar to view text

```

Photo 1. Write Away's help screen, showing most edit commands available.

Write Away produces DOS 3.3 sequential text files; random access files can be read and converted to sequential. The disk and program are unprotected.

The Terminal Program

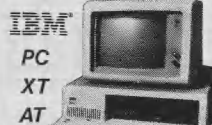
The terminal module provides telecommunications with a multitude of modems, including Hayes and Novation, and serial cards of various descriptions. Documents created by the word processor can be converted to sequential ASCII files (minus the formatting symbols), saved to disk and transmitted via modem.

Besides providing a capture-and-transmit buffer, the terminal program has its own commands

that allow for automatic dial, answer and sign on as well as virtually unattended operation of your Apple's modem. With a clock card installed, such as ThunderClock, it would be possible to dial up Dow Jones at 2 a.m., download the latest quotes on your portfolio and save them to disk; all while you were asleep on your yacht in the Caribbean. (This function is dependent, of course, on having a yacht in the Caribbean!)

Utilities and So On

Additional utility programs permit you to read and reformat spreadsheet DIF files and mailing



64K PC, keyboard, no drive, no control card \$1,250
 64K PC, keyboard, 1 IBM drive \$1,695
 64K PC, keyboard, 2 IBM drives \$1,895
 10MB hard disk \$2,995
 128K XT, keyboard, 1 floppy drive & a 10MB hard disk \$3,595
 For each 64K Memory add \$50
 512K AT, keyboard, 1.2MB drive, call
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SOFTWARE FOR IBM PC



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 Quadchrome 12" RGB color, super high res. 600x430-dot, 16-color \$495
 NEC JC1216DFA, 12" RGB, 640x200 dot, w/ interface cable \$449

GREEN SCREEN

IBM Monochrome, 12", 720x400 \$255
 Dynaex GM-12, 12" green, high resolution, 600x400, 20 MHz \$129
 XENON 12" green, high resolution, 800-dot, 20 MHz, comes with RGB & serial cable, gray cabinet matched the IBM PC A special buy! \$119
 Roland DG MB 122G, 12" green, 18 MHz, high resolution 720x350 dots, fully compatible with IBM monochrome display card \$179

AMBER SCREEN

Dynaex AM-121, 12" amber, 600-dot high resolution, 20MHz \$139
 Xenon 12" amber, 18 res 800-dot, RGB & serial cable \$125
 Princeton MAX-12, 12" amber, 720 x 350 dot, runs off IBM monochrome display adapter \$119
 Amdex 310A, 12" amber, 300-dot high resolution, designed to run on IBM monochrome display card \$165

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Memory installed on card 64K 128K 192K 256K 320K 384K
 with parallel, serial ports & clock \$257 \$312 \$367 \$422 \$477 \$532
 above plus game port \$277 \$332 \$387 \$442 \$497 \$552

QUADRAM

Amount of memory installed 0K 64K 128K 192K 256K 320K 384K
 w/parallel, serial, game ports, clock \$235 \$275 \$325 \$375 \$425 \$475 \$535

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 Memory installed 64K 128K 192K 256K 320K 384K 448K 512K
 \$399 \$459 \$519 \$579 \$639 \$699 \$759 \$819

HERCULES GRAPHICS CARDS - Creates hi-resolution graphics on the IBM monochrome. \$349
 Paradise Multi-Function Card - for both color and monochrome displays, w/ parallel port. \$399
 Vista Disk Master - Disk controller card for both 5 1/4" & 8" drives, IBM-PC/XT compatible \$169
 Printer Interface Card - A half size card for short slot. Ideal for use with color card. \$69
 Planitronic COLORPLUS - offers more colors in hi-res. mode, w/ printer port. \$379
 Tecmar Graphic Master - highest res. in color & mono displays w/ graphics. \$499
 STB GraphixPlus - operates color & mono displays w/ graphics & printer port. \$369
 Multigraph Card by Profit Systems - 640x400 dots. 16 colors in color mode. 720 x 350 dots in monochrome, plus hi-res. graphics w/ 132-column display. \$499
 Koala Graphics Pad w/ software for IBM-PC. Requires color card & game port. \$125
 Quadcolor II - offers twice amount of memory & 2 true colors in hi-res. mode. \$219
 Quadcolor II - A daughter board for Quadcolor I, adding 2 more games mode. 136 colors in med. res. mode and 16 colors in hi-res. mode, plus game port. \$229
 Persyst Color Display Card - gives same quality features as IBM color card. \$195
 MonographPlus Card by AST - offers hi-res. graphics on monochrome display. Lotus 1-2-3 and Hercules compatible. With parallel port & clock/calendar. \$445
 Optional serial port for MonographPlus \$35

Special Purpose Cards

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 Optional serial port for MonographPlus \$35

5% DISK DRIVES

Tandon TM-100-2, full ht. DSDD \$179
 Tandon TM-100-4, full ht. DSDD \$289
 Control Data 8409, full ht. DSDD \$215
 Control Data 8428, half ht. DSDD \$189
 Teac 558, half ht. DSDD Sale! \$149
 REMEX 2 1/2 height, DSDD Sale! \$99
 IBM half height, DSDD \$219
 IBM half height, DSDD \$329
 Mitsumi (same as Panasonic) 1/2 ht. \$145
 Qume 142, half ht. DSDD \$229
 HITACHI half ht. DSDD \$140
 Shugart SA455, half ht. DSDD \$189
 Toshiba 4851, half ht. DSDD \$195

Hard Disk Sale

Maynard WS-1, 10MB hard disk w/ Sandstar multi-function card & hard disk controller module \$995
 Maynard WS-2, 10 MB hard disk w/ Sandstar floppy disk & hard disk controller module \$1150
 Maynard WS-3, 10 MB hard disk w/ Sandstar memory card (no menu) \$1,149

CMS Hard Disk Plus - 10 MB hard disk, w/ controller card. Boots with just diskette. A fantastic buy! \$879

Sysgen

TAPE BACKUP
 An economical way to back up 10MB in 4 minutes on a single cassette. \$875

DYNAMIC RAM CHIPS

4164 (64K) 200 nanosec. \$5.95 ea. 9/345
 4164 (64K) 150 nanosec. \$6.95 ea. 9/355

8087 CHIP

Latest Intel 8087, high speed \$169
 Math co-processor. \$169

Modem Sale!

Hayes 300, external, 300 baud \$199
 Hayes 1200, external, 1200 baud \$485
 Hayes 1200B, internal w/ software \$429
 Hayes 1200B, above w/ software \$385
 Bicom IntelModem 1200 \$429
 Prometheux ProCom 1200/clock \$429
 Novercom 1200 \$225
 Ventel Half Card, 1200 baud, fits slot in IBM-XT & portable \$425

The POWER DIRECTORS

P2 - A unique control center and surge protector w/ 5 lighted and a surge rocker switches for your computer & accessories. It also filters out EMI & RFI interferences. \$125
 P12 - Similar to P2 but w/ 5 switches, a master switch & digital clock. \$179

NEC SPINWRITER

3550 - 33 CPS, 203 col., proportional space, bi-directional, parallel \$1499
 2050 - Similar to 3550 but 19 cps \$789
 7730 - 85 CPS, 203 col., parallel \$1649

DIABLO

C-150 Color Ink Jet Printer - 20 cps. 16-color print head produces 7 solid colors in med. res. mode. For literally thousands of shades. 120 dot/in. resolution. 12x18-dot text. 8 1/2" print width. Parallel \$1,150
 Series 36, 36 cps daisywheel \$1,295
 Diablo ECS/IBM, 40 cps daisywheel printer, graphic capability \$1,950
 F32 Two-in sheet feeder \$1,195
 Diablo P22C01, 150 cps dot matrix \$795
 Diablo P38, 400 cps dot matrix \$1,695

QUME

LetterPro 20, letter quality daisywheel printer, 20 cps, 13" paper \$595

GENESIS Cutsheet Feeder

Single bin feeder, mechanically driven for high reliability - no electronics, no motor. Easy installation. Available for Diablo 820-830, C. trait F-10, Brother HR-1, DaisyWriter 2000, Silver Reed 550, NEC 3550 (please specify) \$475

Tech 5 Selector Switches

Now you can direct your computer out put to a different printer or data device by a flip of a switch.
 Centronic A-B - All 36 pins switched Gold plated connectors, Plastic case \$149

DATASHIELD

Model 100, 6-pin plug & nose protector w/ audio & visual warning. \$65
 PC-200, 200-watt power supply backup which also takes over within 10 milliseconds. Built-in surge protector \$295
 XT-300, above but 300-watt \$395

JUKI 6100

18 CPS daisywheel, 13" platen, 2K buffer, 3-qtch, (parallel) \$415

SOFTWARE REVIEWS

list files from Nibble magazine's A.I.M.S. program, Avant-Garde's Creations, CCA's DMS and Continental Software's First Class Mail, or you can use a mailing list of your own creation. There are two tutorials on disk, a comprehensive 250-page instruction manual (with index), a quick-reference card and several sample files to demonstrate Write Away's many features.

But, you ask, "Does it work? What do you think?" While Write Away is fairly easy to step into, like a pair of shoes, this word processor/terminal program will take some heavy-duty usage before it's completely comfortable. The sheer magnitude of the available options preclude quick familiarity. The function keys alone offer so many interesting possibilities that only an experienced user will be able to take advantage of their full potential. However, you will be able to boot up and write an attractive document with only a few hours' practice.

With the extensive editing and formatting commands, macro capability, function keys, universal printer directives and excellent terminal program integration, Write Away provides Apple owners with one of the best word processors available. I especially liked the fact that Write Away is unprotected, uses normal sequential text files, appears extremely fast, allows an exit to Basic (do whatever and return) and provides the capability to use all of the exotic features of my two nonstandard printers.

In addition, several calls to Midwestern Software gave me the impression it's a company concerned with customer satisfaction. The program is recorded on both sides of the disk; registered owners are informed of updates; and Midwestern guarantees bug-free performance.

I'll apologize in advance for the obvious pun and conclude with the strongest endorsement a reviewer can give. I'll be using it—right away.

Arthur Ude
 Stoddard, NH

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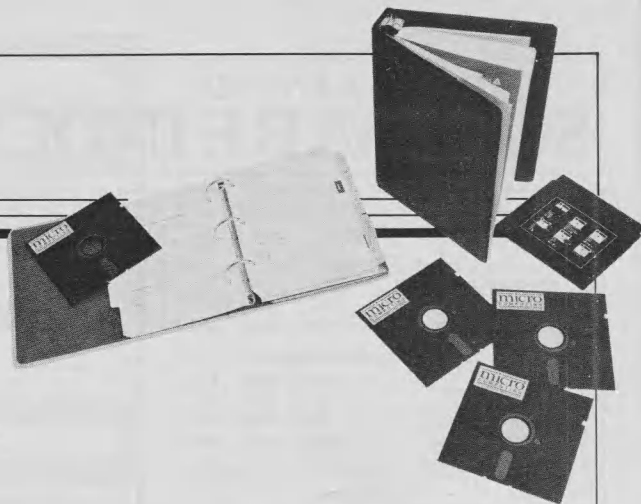
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NEW SOFTWARE

Edited by Amy Campbell



Mapping It Up

StatMap (\$995) is a data-driven, menu-oriented demographic and statistical mapping package. You can go map-happy generating maps by state, county, ZIP code area and more with your 128KB RAM IBM PC with graphics adapter.

You select the part of the country to map from an extensive menu of options, including states, counties, congressional districts, ZIP code areas and census tracts. Then you decide what demographic or statistical information to display. You can enter information manually or tap your dBase II and ASCII files.

StatMap creates a color-coded map of the area and information you select. For use with a plotter, StatMap requires an asynchronous communications adapter. You can control the format of your map by defining data ranges, hatch patterns, colors and so on.

A clip- and zoom feature lets you focus on one part of your map, enlarge it and produce a detailed area map. Another feature lets you arrange several maps into a complete on-screen slide show. StatMap integrates with the Presentation & Business Graphics System. Both packages are available from Ganesa Group International Inc., 1495 Chain Bridge Road, Suite 300, McLean, VA 22101. Reader Service number 401.

Fun Potential In Artpak

Artpak (\$99) is a graphics program that features drawing, animation and music. To use it, all you need is an IBM PC, XT or PCjr with color graphics card, a keyboard and, of course, your imagination.

With the animation applications of Artpak, you can

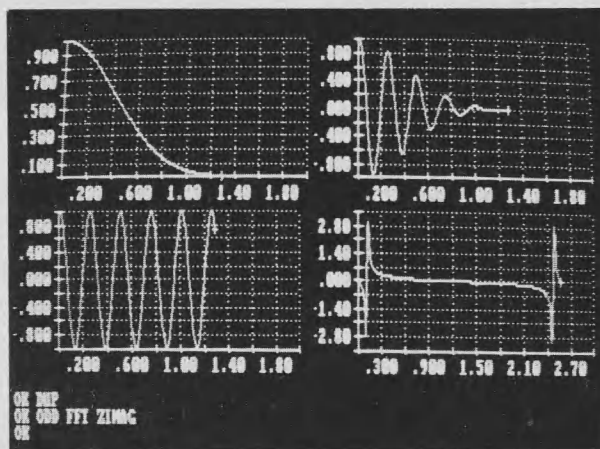
such as blinking, dissolves, trailing motion and music. You can distribute shows you create to third parties without license or restriction. Artpak is menu-driven and uses single keystrokes to call commands.

For more information, contact PalSoftware Corp., 1104 Canterbury Drive, Stevens Point, WI 54481. Reader Service number 403.

print data produced by scientific instruments and experiments.

Asyst consists of three modules. The System/Graphics/Statistics module (\$795) establishes the system environment, stores data and provides graphics and basic statistics and math functions. The Data Analysis module (\$495) reduces, manipulates and analyzes data, and provides advanced mathematical capabilities. The Acquisition module (\$495) lets you interface your computer to scientific instruments and capture data directly into the Asyst environment.

The software utilizes the Intel 8087 processor and 320KB RAM. Contact Macmillan Software Co., 866 Third Ave., New York, NY 10022. Reader Service number 404.



With Asyst's windowing capabilities, you can make graphic comparisons on screen.

What Did the IBM Say to the Macintosh?

"Anything you can paint, I can paint better!" says the IBM PC to the Macintosh since its pal Dr. Halo came to town. Like MacPaint, Dr. Halo (for the IBM PC) uses a mouse and icons to create graphics. But unlike MacPaint, Dr. Halo supports color. It's enough to make proud Macintosh owners turn blue.

Dr. Halo (\$99) works with Microsoft, Mouse Systems and Summagraphics mice as well as several digitizers.

create product demos, sales presentations, cartoons, educational shows or any form of on-screen entertainment you dream up. By storing hundreds of images on a single disk, you can create animated sequences that make birds fly or windows appear in different parts of the screen.

It supports special effects

Integrated Science Package

Macmillan Software Company has released an integrated software package geared toward scientists, engineers and mathematicians. Asyst lets you acquire, manipulate, analyze, graphically display and

Dr. Halo includes filled and unfilled rectangles, circles, squares and ellipses, numerous colors and filled-hatch styles. It has several type fonts (even the Greek alphabet), variable brush widths and copy and save commands.

You can edit images created by other programs, such as graphs created by Lotus 1-2-3. An added feature lets you animate individual frames. Developed by Media Cybernetics, the package is available from Lifeboat Associates Inc., Dept. C, 1651 Third Ave., New York, NY 10128. Reader Service number 402.

Mac and IBM PC: On Speaking Terms

A communications package called PC to Mac and Back (\$99.95) bridges the gap between the IBM PC and the Macintosh computers. In addition to letting these two dissimilar pieces of hardware talk, the package equips either machine for on-line communications through use of a modem.

The package includes an IBM disk, a Macintosh disk and a book. PC to Mac and Back also transfers files between two IBM PCs, two Macintoshes or virtually any other computer with an RS-232C serial port and its own communications software.

The Software provides three different error detection protocols (including X-modem) as well as an ASCII text mode that performs no-error checking. System requirements for use on the IBM PC are DOS 1.1 or 2.0, 128KB RAM, one disk drive and an RS-232 serial port. A modem is recommended and the software is Microsoft Mouse compatible.

Macintosh requirements include 128KB RAM and one disk drive, and a modem is recommended. For more information, contact

dilithium Press, 8285 S.W. Nimbus, Suite 151, Beaverton, OR 97005. Reader Service number 405.

Run Lotus 1-2-3 On a Kaypro

A utility from SWP Microcomputer Products, maker of the SWP Co-Power-88 card for the Kaypro 10 and 4/84, lets you run the IBM PC release of Lotus 1-2-3 (release 1A) on a Kaypro with the add-on card.



Flying Colors with Printout Program lets the blank screen of your Apple II Plus bring out your creativity.

The program runs as it does on the IBM PC with a monochrome board. Although you can't display graphs on the screen, you can print them. The utility requires SWP's MS DOS 2.11A.

The Co-Power-88 is an 8088 coprocessor adaptable to many popular Z80 CP/M computers. The processor runs at 5.33 MHz, has 256KB RAM and acts as a high-speed RAM disk when you run CP/M programs on the host computer.

The Lotus 1-2-3 utility is available for \$29 from SWP Microcomputer Products Inc., 2500 East Randol Mill Road, Suite 125, Arlington,

TX 76011. Reader Service number 408.

ProDos Assembler for Apple IIe and IIc

Merlin Pro (\$69.95), a ProDOS macro assembler (which also functions under DOS 3.3) has more than 40 commands, including add, delete, copy, move and global search and replace. Printing commands for headers and page number-

assembler to produce Merlin Pro source code from binary data; Printfiler sends assembled listings to text files; and XREF produces complete cross-references of program labels by line number or address.

Merlin Pro comes on two disks, isn't copy protected and is compatible with the Apple IIc and 128KB RAM Apple IIe, hard disks and program selectors and the Videx Ultra-Term. Merlin Pro is available from Roger Wagner Publishing Inc., 10761 Woodside Ave., San-tee, CA 92071. Reader Service number 412.

Teach IBM to Read Apple Disks

With Apple-Turnover (\$279.50) from Vertex Systems, you can transfer files between Apple and IBM disks. After installing the board, insert Apple-DOS 3.3 or Apple CP/M disks in the IBM drive and you can copy files or an entire disk. The card eliminates serial-file transfers and modems, and lets you format Apple disks on the IBM.

The half-sized board can be installed in any expansion slot between the regular disk controller card and the normal IBM disk drives. The package includes menu-driven software and an Apple test disk.

Apple-Turnover runs under MS DOS on the IBM PC or XT with 128KB RAM. For more information, write Vertex Systems, 6022 W. Pico Blvd., Suite 3, Los Angeles, CA 90035. Reader Service number 406.

Disk Format Translator

Disk-Tran conversion programs are now available for the IBM PC or XT and Zenith Z-150 computers, enabling them to read from and write to the Osborne (single-sided, double-density), Kaypro (single-sided,

ing make entering and editing programs easy.

The assembler is an advanced version of the Merlin assembler that includes new opcodes and features, such as a relocating linker, true macro libraries, support for conditional assembly and printing of processor cycle times in program listings. It assembles 6502, 65C02 and 65802 codes as well as Sweet 16 code.

Merlin Pro comes with three complete disassemblies of Applesoft Basic for the Apple II, II Plus, IIe, IIc. The package also includes three utilities: The Sourceror is a symbolic dis-

NEW SOFTWARE

double-density) and Cromemco (double-sided, double-density) disk formats.

Disk-Tran permits reading, writing and formatting of foreign disk formats on an IBM PC under PC DOS, a Zenith Z-150 PC under MS DOS, a Zenith Z-100 under CP/M-85 or ZDOS, or a Zenith Z-90 under CP/M-80.

The PC DOS and MS DOS programs cost \$30 each or two for \$50. ZDOS and CP/M programs are \$20 each. Your order includes a modem program that supports error checking and is useful in receiving modem updates of the product. Include \$1 postage and handling when ordering from Computer Consultants to Business, 1033 Bishop Walsh Road, Cumberland, MD 21502. Reader Service number 407.

Coloring Fun On Your Apple

Flying Colors with Print-out Program (\$69.95) is an integrated color graphics, slide projector and printout software package for the Apple II Plus, IIe and IIc computers. With it, you can create color graphics with an interactive drawing program and print out your creations on any of 37 supported dot-matrix computers. The program stores pictures in 33- or 34-sector binary files.

The slide projector program enables you to store, recall, organize and display on-screen pictures manually or automatically. The system doesn't require graphics interface cards. Flying Colors is manufactured by The Computer Colorworks, 3030 Bridgeway, Suite 201, Sausalito, CA 94965. Reader Service number 411.

Computerizing The Household

So you have the office up and running with computer applications, but have you

ignored the benefits of putting your computer to work at home? With the Home Executive (\$89.95), you can run your household as efficiently as you've learned to run your office.

The Home Executive is an integrated package designed to help you keep track of at-home data. It includes nine programs, each with report generators: Address Book, Appointment Book/Calendar, Checkbook, Collector's List, Household Inventory, Gift List, Expenses, Portfolio Manager and Financial Analyst.

The programs run on the IBM PC and PCjr, Apple IIc, Macintosh and Commodore-64. For more information, Contact Superex Home Software, 151 Ludlow St., Yonkers, NY 10705. Reader Service number 410.

Your Macintosh Can C

The Macintosh C development system from Manx Software Systems is available as a personal system called Aztec C68K-p and a commercial system called Aztec C68K-c. A set of development utilities, the Aztec C68K Toolbox, is also available. Both versions run on the Macintosh with 128KB RAM and one or more disk drives.

The personal system consists of a full C compiler, a 68000 relocating macro assembler, a full Unix system library, an editor and a shell command environment. The commercial compiler includes all of the features of the personal system plus support for the full Macintosh toolbox, including windows, an overlay linkage editor and dynamically relocatable code.

The development software is also available as a cross-development system from PC DOS, MS DOS, CP/M-86, PDP-11, VAX and Lisa. Prices start at \$199 for the personal system.



Run your household with the same efficiency you strive for at work with The Home Executive.

Write to Manx Software Systems at Box 55, Shrewsbury, NJ 07701. Reader Service number 413.

Plagiarize Your Own Documents

With Docu-Power! (\$149) you can produce new documents from bits and pieces of your old files. It attaches to your present word processor and lets you assemble random paragraphs, sections, pages or any other

word processor text into a master-indexed resource file of reusable ideas.

Docu-Power! is published by Computing! (2519 Greenwich St., San Francisco, CA 94123) and is available in 20 disk formats for all CP/M, CP/M-86 and IBM personal computers. Reader Service number 409.

Microcomputing prints information on new software based on information supplied to us by manufacturers. Inclusion of a product does not signify an endorsement.



Manx Software Systems has released two C development programs for the Macintosh.

NEW SOFTWARE

Put Your Data On First Base

Who's on first? DeskTop Software Corp. says you'll be when you use 1st Base (\$195), its relational database system for the Apple Macintosh.

With file handling and report writing options, the system offers multiple file capability, user-defined file formats, automatic generation of data entry screens, use of all Macintosh editing features and nested sorts

for up to ten keys. It handles up to 50 fields per record, up to 50 list fields per report and up to ten sort fields per report.

With points and clicks of the mouse, 1st Base lets you create personnel files, prospect lists, columnar reports, mailing labels and other applications. To learn more about what's in 1st Base (... wait a minute, What's on second!) write DeskTop Software Corp., 228 Alexander St., Princeton, NJ 08540. Reader Service number 414.

set of mathematical functions, including the standard transcendental and trigonometric functions; new library functions that let MS DOS 2.x programs load another program and return control to the original program; as well as a number of miscellaneous Unix-compatible functions. The new version costs \$500; current owners can upgrade through their original vendors. (Lattice Inc., PO Box 3072, Glen Ellyn, IL 60138.)

Apple Computer has upgraded its **Apple Writer II** word processor to version 2.0. Enhancements include horizontal scrolling, page and line count shown with text display, a built-in terminal mode (to access information services from within Apple Writer) and a utility to format Apple Writer II disks without a ProDOS user's disk. Version 2.0 sells for \$149. Existing owners can upgrade by sending \$50, master disk and manual cover to Apple Computer Inc., Apple Writer II Upgrade, PO Box 306, Half Moon Bay, CA 94019.

Version 1.4 of Micrografix Inc.'s **PC-Draw** (\$395) is reported to offer hard disk support, faster loading programs, plotter support (Hewlett-Packard and Houston Instrument), improved error trapping, Okidata printer support, increased block select, move and reselect capacity and more. The reference manual has also been improved, adding an index, glossary, tutorial and command summary. Current owners can upgrade to version 1.4 for \$50 through Micrografix Inc., 1701 N. Greenville, Suite 305, Richardson, TX 75081. (See review in this issue.)

Updates and Enhancements

The latest version (2.12) of Lattice Inc.'s **8086/8088 C Compiler** offers an expanded library, including the following features: an I/O function that determines which version of MS DOS is present and adjusts the system calls accordingly; library routines that perform floating-point arithmetic using the 8087 math processor if present; a full

MOVING?

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NEW PRODUCTS

Edited by Amy Campbell

The Apricot F1 (left) and the Apricot Portable (right), 8086-, MS DOS-based personal computers, are compatible with ACT's multi-user and networked systems.



An Apricot to Go

Applied Computer Techniques (ACT), maker of the Apricot Executive microcomputer, has introduced the Apricot Portable, a 13-pound 8086-based machine that incorporates voice recognition, a 25-line by 80-column (640 × 256 pixel) LCD screen; 256KB RAM (expandable to 1MB); a 720KB, double-sided, 3½-inch disk drive; infrared keyboard and infrared mouse/trackerball; electronics that can drive an out-board color monitor at the same time as the LCD

screen; and bundled executive, graphics and system software.

The Apricot Portable (\$2695, or \$3195 with color electronics) is software-compatible with ACT's MS DOS Apricot. You can expand the portable with an optional 10MB Winchester disk drive or five-slot expansion box.

ACT has also released an entry-level business desktop machine, the Apricot F1 (\$1595 without a monitor), that features an infrared keyboard, color electronics and bundled executive,

graphics and system software. For information on either machine, contact ACT Computers Inc., 3375 Scott Blvd., Santa Clara, CA 95051. Reader Service number 426.

Corvus Unveils Mac Hard Disk

Mass storage magnate Corvus Systems has released a version of the OmniDrive 5¼-inch Winchester disk storage system for the Apple Macintosh. Software for communicating with the Macintosh is built into the drive, eliminating complicated initialization procedures.

It's available in four capacities: 5MB (\$1795), 11MB (\$2495), 16MB (\$3195), and 45MB (\$4995) from Corvus Systems Inc., 2100 Corvus Drive, San Jose, CA 95124. Reader Service number 437.

An ADDS with A Mind of Its Own

Applied Digital Data Systems Inc. (ADDS), probably the best known manufacturer of display terminals, has released the ADDS PC/I and ADDS PC/II, its two intelligent workstations/IBM-compatible personal computers.

The 8088-based, MS DOS machines include 256KB RAM, 360KB floppy disk

storage capacity and a 12-inch monochrome display. The ADDS PCs provide resolution for 40-character by 25-line text (eight pages), 80-character by 25-line text (four pages), 320 × 200-pixels color display (four colors and 16 background colors), and 640 × 200-pixels monochrome display.

Both computers come standard with video output for monochrome, composite color and RGB-1, and with interfaces for a light pen, rf modulator, and serial and parallel printers. Other standard features include an 8087 coprocessor, five expansion slots, MS DOS 2.11, GW Basic and built-in self-diagnostics.

PC/I with a monochrome monitor sells for \$2650; PC/II with a 10MB Winchester drive sells for \$4200.

For more information, contact The Intelligent Workstations Manager, ADDS Display Products Division, 100 Marcus Blvd., Hauppauge, NY 11788. Reader Service number 425.

Canon Announces 8086 IBM Clone

Canon USA has recently entered the IBM PC-compatible market with an 8086-chip machine. Standard features are 256KB RAM, two double-sided, double-density half-height drives (360KB per drive)



ADDS distributes its PC/I and PC/II IBM-compatible personal computers worldwide with six foreign-language versions of MS DOS and companion keyboards.

NEW PRODUCTS

and bundled MS DOS version 2.1 and GW Basic version 2.0.

The Canon Personal Computer is available in color and monochrome models. The monochrome model (\$2495) has a 12-inch, hi-res green phosphorus screen that handles 40 or 80-character columns by 25 lines. The color model (\$2995) has a 12-inch screen that produces 16 different colors. Resolution for black and white graphics on the color screen measures 640x200 pixels and 320x200 pixels in four-color graphics mode.

Both models offer five IBM-compatible expansion slots. Canon USA Systems Division is located at One Canon Plaza, Lake Success, NY 11042. Reader Service number 427.



More than cameras and copiers, Canon USA is now manufacturing two IBM-compatible, 8086-chip MS DOS personal computers.

Three Amdek Color Monitors

Amdek has released an NTSC composite color video monitor (the Amdek Color 300) and two hi-res RGB black matrix CRT display monitors (the Amdek Color 600 and 700).

All three models function with most personal computers and include front-mounted operator controls and a built-in speaker and headphone jack. An optional tilt/swivel base is available for any model.

The Color 300 (\$350) features 260-dot by 300-line

resolution and a dark bulb CRT. It displays up to 40 columns by 25 lines of text.

The Color 600 (\$650) provides 640-dot by 240-line resolution and produces 80 columns by 25 lines of text display. The Color 700 (\$750) produces 720-dot by 240-line resolution and provides up to 96 columns by 25 lines of text per screen. All monitors can display a full 16 IBM or Apple colors.

For more information, contact Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007. Reader Service number 428.

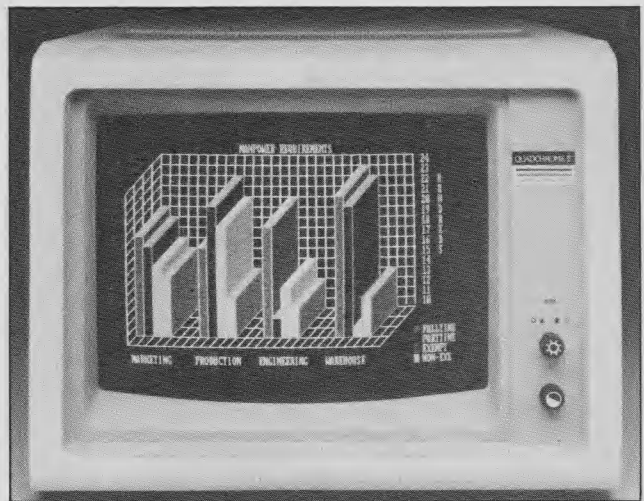
A Touching Experience

You can incorporate touch-sensitive screen tech-

nology into your IBM PC or compatible with The Soft-Touch. The touch-sensitive screen device lets you add touch technology without affecting your investment in existing equipment.

The Soft-Touch (\$495) uses an infrared scanning beam arrangement to provide high-resolution touch detection. It consists of a bezel that mounts over the front of your IBM 5151 monochrome or Princeton color graphics monitor, an interface card and connecting cable. Interfaces are available for the Apple II series and the Sony PC.

You can program The



The Quadchrome II is a 16-color, 14-inch screen in an IBM-style cabinet.

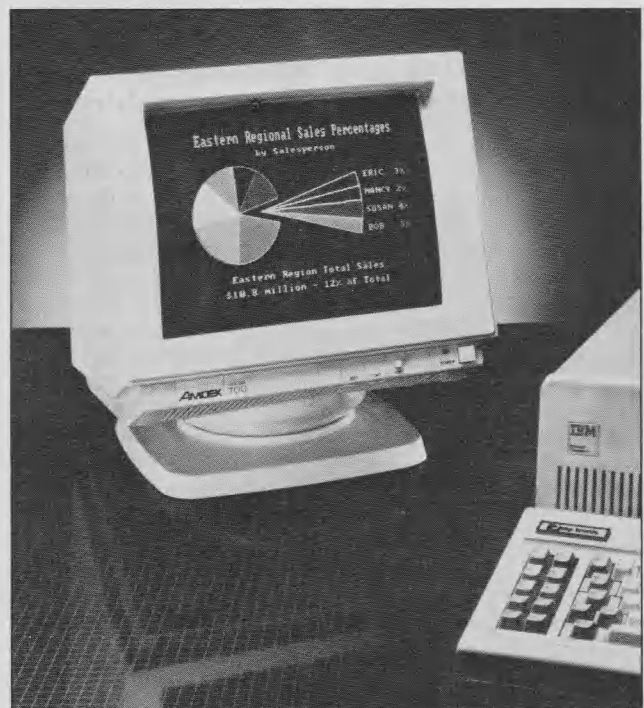
Soft-Touch in Basic or assembly language. It's manufactured by BFANM Corp., 1704 Moon N.E., Albuquerque, NM 87112. Reader Service number 430.

Fourteen-Inch Color Monitor

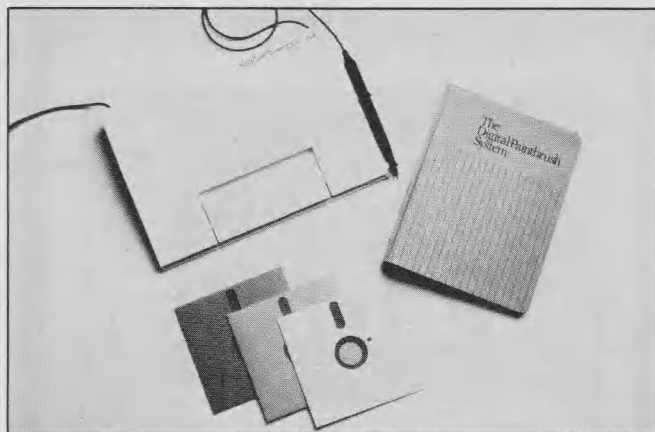
If bigger is better, then you'll like this 14-inch monitor from Quadram. Quad-

chrome II (\$650) uses a dark picture tube to produce sharp, vivid colors (16 at once). With a resolution of 640 dots by 240 lines, the monitor displays 25 lines of 80 characters in the text mode.

Quadchrome II is available from Quadram Corp., 4355 International Blvd., Norcross, GA 30093. Reader Service number 429.



Amdek's new high-quality color monitors come with a two-year warranty.



The Digital Paintbrush System from The Computer Colorworks lets you digitize, present, print and telecommunicate graphic images.

The Digital Paintbrush System

The Digital Paintbrush is a \$299 high-resolution digitizing device designed to operate like a pen. It consists of a pen barrel, a tip/cursor control for drawing and menu selection, and a barrel switch for menu removal and retrieval. A separate housing unit contains two high-resolution rotating potentiometers connected to the pen via two control lines. Through a series of trigonometric calculations, the device reproduces drawing or tracing movements onto an Apple II Plus, IIe, IIc or IBM PC screen.

You can project images made with The Digital Paintbrush as slides on a color monitor or TV screen, print them as hard copy or transparencies and photograph them to make 35mm slides.

Software comes on three disks and consists of four components. The Graphic Design program lets you paint in thousands of color patterns with 37 brush shapes and sizes. You can use any of 15 type fonts, expand or contract images, access a library of symbols and use grids. The Printout program facilitates the creation of acetate transparencies or hard copy on any of 37 dot-matrix printers. The

Graphics Telephone program lets two people work together via modem and send and receive graphics.

A text screen editor and an area measurement program let scientists and engineers digitize and integrate areas from maps and X-rays.

For more information, contact The Computer Colorworks, 3030 Bridgeway, Sausalito, CA 94965. Reader Service number 431.

New Digitizer from Summagraphics

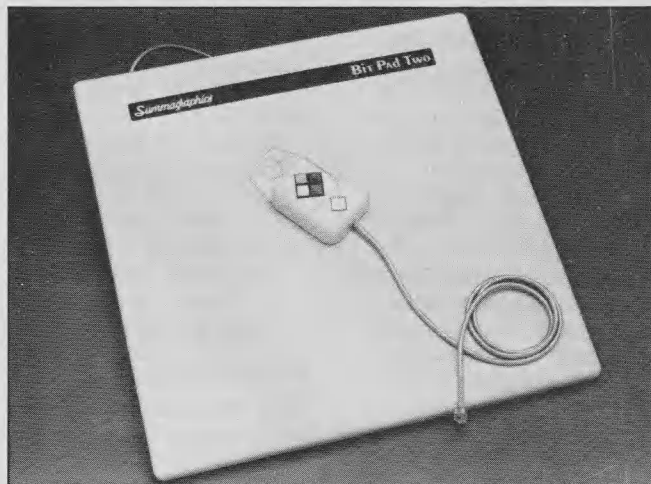
Summagraphics Corp. has replaced its existing Bit Pad One series of digitizers with the Bit Pad Two. The Bit Pad Two (\$640) has a tilt-adjustable, 11 x 11-inch flat work surface for performing all cursor steering, menu picking and graphic digitizing tasks. It offers high reliability, easy integration and electromagnetic technology that eliminates periodic biasing.

The RS-232C-compatible unit is plug- and software-compatible with Bit Pad One and Bit Pad Ten formats. Bit Pad Two uses a three- or four-button cursor or a one-button stylus with solid state pen tip and barrel switches interchangeable via a standard telephone connector.

You can control operation functions, such as resolution (up to .001 inch), sampling and bit rates, remotely or manually. Programmable modes include stream, switch stream, remote request and remote software reset. Contact

digitizer in two sizes: one with a six by six-inch active area (\$338); the other with a 12 by 12-inch active area (\$427). Both pads interface to your computer via an RS-232C or TTL interface.

With a front edge thick-



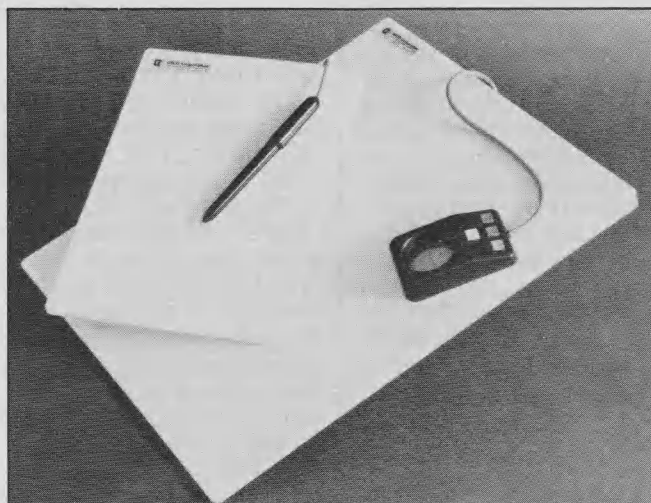
Summagraphics' newest digitizer pad, the Bit Pad Two.

Summagraphics at 777 State St. Ext., PO Box 781, Fairfield, CT 06430. Reader Service number 432.

Micro Digi-Pad: Thin Is In

GTCO Corp. has introduced the Micro Digi-Pad

ness of 3.5 inches, the Micro Digi-Pad is less than one half the thickness of most tablets. Made of unbreakable Lexan, the pad comes with a pen-like stylus that generates no heat or noise. GTCO Corp. is located at 1055 First St., Rockville, MD 20850. Reader Service number 433.

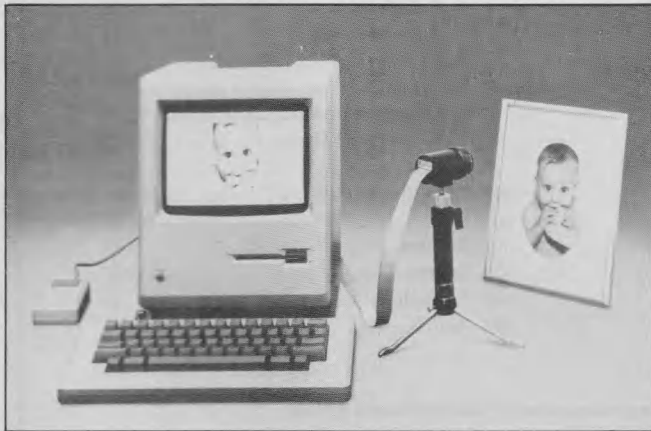


Thin and streamlined, the Micro Digi-Pad comes in two sizes.

Mac Can See Clearly Now

If you're a graphics Mac maniac, then you won't be able to do without one of these gadgets. The Microneye (\$395, is an imaging peripheral that lets the Macintosh take pictures of virtually anything.

Software with pull-down menus lets you print a picture or save to disk. You



Say cheese! With the Microneye, your Macintosh can reproduce images of just about anything.

can enhance the image through Microneye's special built-in features, or you can use any of MacPaint's customizing functions.

The plug-and-go system includes a tripod, lens, hardware, software and user's guide. For more information, contact Micron Technology Inc., Vision Systems Group, 2805 East Columbia Road, Boise, ID 83706. Reader Service number 434.

Phoning For Dollars

Do you spend most of your time on the telephone? If so, there's a new Macintosh peripheral that might make your time on the phone better spent. The MacPhone (\$199) from Intermatrix is a telephone/software system that stores and dials up to 200 names and telephone numbers.

It has touch-tone compatibility with long distance telephone services, and can store up to 20 dialing prefixes of 22 digits each. The system automatically logs (and prints out) phone calls, listing the name of each person called, the starting and ending time of the call, the data, cost of call and consultation charges.

Included are a built-in calendar and a notepad, both of which you can

access while on-line. You can also look up any area code to find what state or time zone it accesses. The billing feature is handy for consultants and lawyers who charge and record hourly fees.

MacPhone works with a standard phone jack and the Macintosh and can also work with a speaker phone, headset or modem. For more information, contact Intermatrix, 5547 Satsuma Ave., North Hollywood, CA 91601. Reader Service number 435.

Houston Instrument Plotter for \$599

Houston Instrument has launched a personal computer plotter price breakthrough with its latest PC Plotter. At \$595, the PC Plotter 595 produces 8½ by



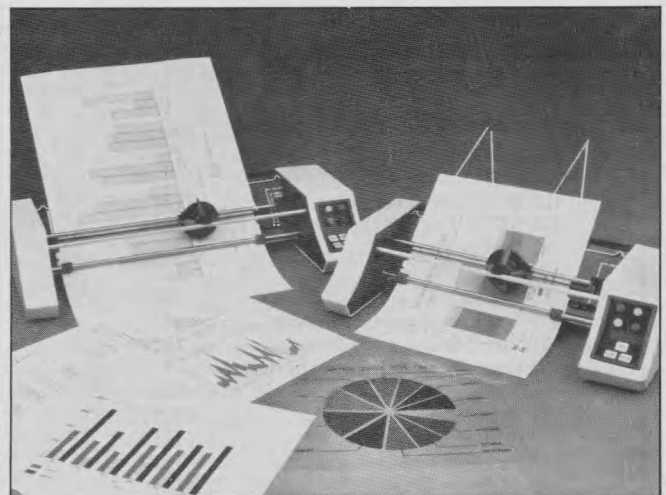
MacPhone's quick-dial feature lets you keep up to 80 names and numbers in pull-down files for instant access and instant dial.

11-inch page graphics. A larger version, PC Plotter 695 (\$695), produces 11 by 17-inch page graphics.

Both four-pen models are compatible with any computer with an RS-232C serial port, and both plotters feature a resolution of .004 inches and a pen speed of up to 4.2 inches per second. As with all Houston

Instrument plotters, the PC Plotter uses HI's unique DM/PL plotting language, compatible with hundreds of available graphics software packages.

You can contact Houston Instrument at PO Box 15720, Austin, TX 78761. Reader Service number 436.



Houston Instrument lowers the cost of plotting with two new models: the PC Plotter 695 (left) and the PC Plotter 595 (right).

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High-Performance Drive for Apple IIe

Beef up your Apple IIe or II Plus with the Tera-drive high capacity 5¼-inch floppy disk subsystem. Using cobalt-coated, high-density floppy disks, Tera-drive has more than 2MB of usable file space on dual 3.2MB unformatted slimline drives. It transfers data at twice the rate of most existing subsystems for Apple computers (62.5KB/second).

The Tera-drive is an alternative to a Winchester disk (for 2MB on-line requirements), and it's large enough to use a hard disk version of the operating system program and still allow for access to all modules in an integrated business system from a single master menu.

Improve Your Memory

The 2megaboard (\$295) memory expansion board with cache memory and print spooling for the IBM PC and compatible computer systems lets you expand to a full two megabytes of memory on a single expansion board. The MegaCache and MegaSpool software increase speed of applications by three to ten times.

Using either 64KB or 256KB RAM chips or a combination of both, you can configure the 2megaboard from 64KB to 2MB. As programs require additional memory, you can increase beyond 512KB RAM in various increments by swapping banks of 64KB chips with 256KB chips as

For more information on the upgrade board and software, contact Datatron Inc., Enhancement Products Division, 2942 Dow Ave., Tustin, CA 92680. Reader Service number 440.

IBM, Epson, Apple Upgrades

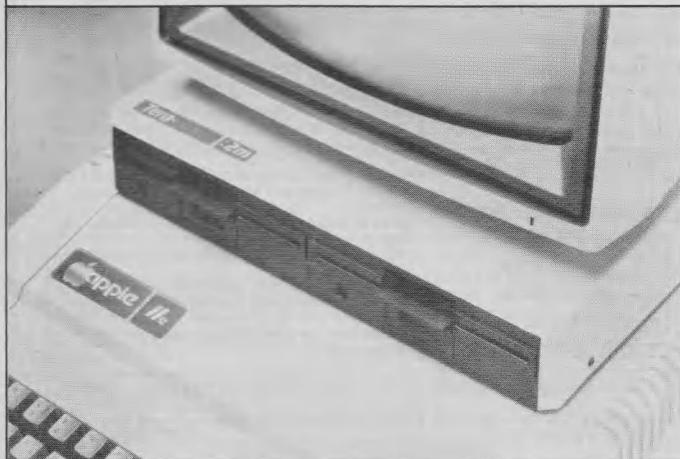
Three hardware upgrades are available from Titan Technologies: the QX-PC MS DOS board for the Epson QX-10 computer, the Accelerator PC board for the IBM PC and the Accelerator IIe board for the Apple IIe system.

The QX-PC (\$795) is an 8088 processor that slips into one of the Epson's five expansion slots and allows it to run IBM PC-compatible MS DOS software. The QX-10 still functions normally running the QX-10 operating system.

The Accelerator PC (\$995) converts the IBM PC to a full-scale 16-bit machine that runs programs two and a half to four times faster than without the upgrade. Available with the Accelerator PC is a memory upgrade piggyback board that lets you put up to 640KB of high-speed RAM and the processor into a single slot.

The Accelerator IIe (\$599) speeds up the Apple IIe's processing three and a half times. To order, contact Titan Technologies Inc., PO Box 8050, Ann Arbor, MI 48107. Reader Service number 439.

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This high-capacity floppy disk subsystem can run hard-disk Apple programs.

The system includes the manufacturer's (Eicon's) enhanced operating system, which supports UCSD Pascal, CP/M and DOS as well as an extended file size for DOS 3.3 (1MB) and automatic dating and tagging features.

Two models (1MB version, \$995; 2MB dual-drive version, \$1595) are available through Eicon Research Inc., 520 Fifth Ave. PH, New York, NY 10036. Reader Service number 438.

needed.

The manufacturer claims the 2megaboard improves speed by 40 to 250 percent with BasicA, SuperCalc3, WordStar and Lotus 1-2-3.

The MegaCache software, especially useful for programs like Framework and Symphony, lets you keep an entire windowing integrated package in cache memory, decreasing access time by up to 50 percent. With 64KB of RAM installed, the board costs \$395.

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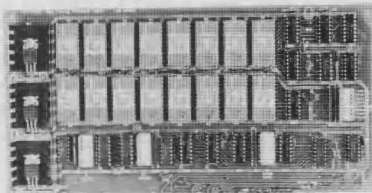
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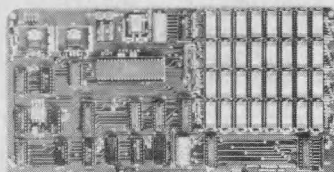
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(WITH CP/M* 2.2
PATCHES AND INSTALL
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- * The LS-100 provides an increase in speed of up to 7 to 10 times on Disk Intensive Software.
- * Compare our price! You could pay up to 3 times as much for similar boards.

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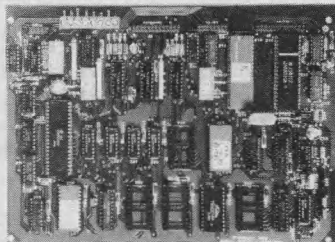
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64K S100 STATIC RAM

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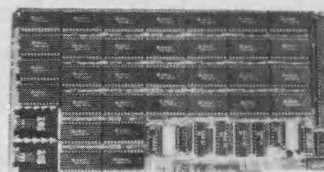
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FULLY SUPPORTS THE
NEW IEEE 696 S100
STANDARD
(AS PROPOSED)

FOR 56K KIT \$185

ASSEMBLED AND
TESTED ADD \$50



FEATURES:

- * Uses new 2K x 8 (TMM 2016 or HM 6116) RAMs.
- * Fully supports IEEE 696 24 BIT Extended Addressing.
- * 64K draws only approximately 500 MA.
- * 200 NS RAMs are standard. (TOSHIBA makes TMM 2016s as fast as 100 NS. FOR YOUR HIGH SPEED APPLICATIONS.)
- * SUPPORTS PHANTOM (BOTH LOWER 32K AND ENTIRE BOARD).
- * 2716 EPROMs may be installed in any of top 48K.
- * Any of the top 8K (E000 H AND ABOVE) may be disabled to provide windows to eliminate any possible conflicts with your system monitor, disk controller, etc.
- * Perfect for small systems since BOTH RAM and EPROM may co-exist on the same board.
- * BOARD may be partially populated as 56K.

64K SS-50 STATIC RAM

\$159.00
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WITH
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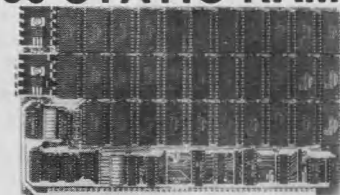
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- * Uses new 2K x 8 (TMM 2016 or HM 6116) RAMs.
- * Fully supports Extended Addressing.
- * 64K draws only approximately 500 MA.
- * 200 NS RAMs are standard. (TOSHIBA makes TMM 2016s as fast as 100 NS. FOR YOUR HIGH SPEED APPLICATIONS.)
- * Board is configured as 3-16K blocks and 8-2K blocks (within any 64K block) for maximum flexibility.
- * 2716 EPROMs may be installed anywhere on Board.
- * Top 16K may be disabled in 2K blocks to avoid any I/O conflicts.
- * One Board supports both RAM and EPROM.
- * RAM supports 2MHZ operation at no extra charge!
- * Board may be partially populated in 16K increments.

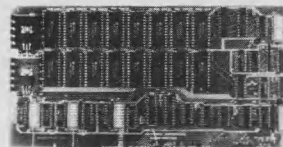
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- * Supports Phantom
- * On Board wait State Generator
- * Every 2K Block may be disabled
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- * Perfect for MP/M* Systems
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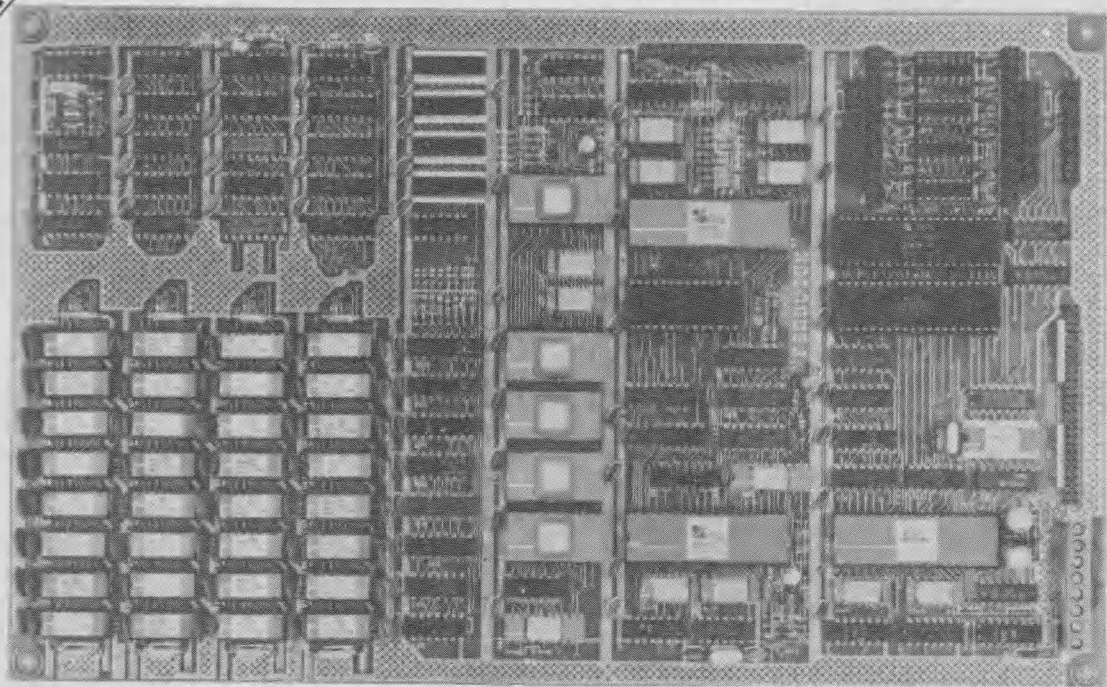
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BOOK REVIEWS

Edited by Nancy Kipperman

Software Toolkit for Microcomputers

Edited by Max J. Schindler
Selected from *Electronic Design Magazine*
Hayden Book Co. Inc., 1983
50 Essex St.
Rochelle Park, NJ 07662
Softcover, 348 pp., \$16.95

Software Toolkit for Microcomputers is a collection of articles culled from *Electronic Design Magazine* that explores software and manufacturers' product prototypes. The book's editor divides the book into six sections; its contents lean toward process control applications and system software design. You'll explore high-level programming languages and compilers design, operating systems design, multitasking and multiprocessing mechanics, computer-assisted testing of electronic circuits and new processor architecture concepts.

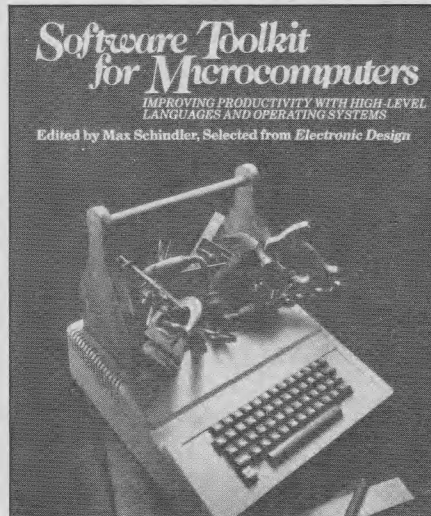
An Enlightening Book

You'll investigate the new technology sitting on the designer's desk; you'll glimpse the near future; you'll read about supercomputers on a chip and the software that drives them; and you'll find out the software industry's plans to bring the cost of software more in line with hardware costs.

Most of the articles are written by hardware and software engineers for engineers, so you need to know some programming and something about computer internals to understand the text.

Some of the authors merit a special mention; their articles are readable and understandable to computer users, not just software designers like me.

Max J. Schindler, senior editor for *Electronic Design*, has included three of his own articles. "New Architecture Keeps Pace with Throughput Needs" and "System Performance Hinges on



CPU Architecture" introduce you to your computer's innards and discuss new ways to assemble processors. "Pick A Computer Language that Fits the Processors" tells you all you need to know about high-level languages. Schindler exposes the particular language's shortcomings and demonstrates its suitability to solving problems.

Making Computers Compatible

In "Native-Code Compilers are Portable and Fast," James G. Letwin and Andrea C. Lewis from Microsoft explain that they won't have to reinvent the wheel every time someone designs a new computer. This can bring down the cost of programming languages while ensuring compatibility between microcomputers. If a computer language is portable, it makes sense that the applications program written in that language should be portable as well. Just imagine—no more program re-writing to move from an Apple to a TRS-80 or an IBM PC.

A mention goes to Chuck Bostrom of Plantronics/Zehntel, who tells how manufacturers test cir-

cuit boards with computers in his article, "Software Package Generates In-Circuit Programs." Ever wonder how Apple Computer is able to manufacture a working Macintosh every 37 seconds? Well, this article will provide the answer in terms of quality control.

In the Belly of the Beast

By now you should be ready for a series of articles on multitasking and multiprocessing by David L. Ripps. You'll find out why your microprocessor should be doing more than one thing at a time and how you can accomplish this on any eight- or 16-bit microprocessor, provided you have the proper software.

Although most of the text concentrates on process-control applications, the same techniques also apply to mainframe computers and will speed up applications and let you and your colleagues update the same file simultaneously. Soon, you'll be able to access that inventory file without disturbing order-entry. You'll even be able to make your general ledger postings while the stock list is being printed. All that with one microcomputer!

The final article, "Data Flow Machines Threaten the Program Counter," by Douglas Johnson of Texas Instruments, describes how a new way of building computers might improve processing speed while keeping down cost and size.

Although the book's numerous typos are annoying, *Software Toolkit for Microcomputers* is a must for hackers and users who want to know more about their computers. You'll reach a better understanding of your computer and sneak a special glimpse of where the industry is going.

Francois Faguy
Quebec, Canada

The Compleat Apple CP/M

Steven Frankel

Reston Publishing Co., 1984

11480 Sunset Hills Road

Reston, VA 22090

Softcover, 233 pp., \$12.95

Do you ever wonder why some Apple owners want to use another operating system in their machine or why some folks are willing to spend \$300 or \$400 to buy a card that lets them run CP/M software? With the wide variety of packages that work under standard Apple DOS (something like 16,000 of them), why look elsewhere?

In *The Compleat Apple CP/M*, author Steven Frankel makes a convincing case that this is a myopic viewpoint: some programs simply aren't available in other than the CP/M format; CP/M can be almost civil once you have a little experience with it; and there's a wide range of free software out there—all available to you, once you plug that CP/M card into your Apple.

Seems Complicated

Part of the reason many folks shy away from CP/M is its seeming complexity; a quick glance at any CP/M book or program manual reveals a wide variety of hard-to-understand messages and cryptic commands. For example, while Apple DOS will tell you your disk drive door is open by reporting an I/O error, CP/M says BDOS ERR ON A: BAD SECTOR (even if all your disk sectors are perfect). Frankel's chapter on "Coping with CP/M" helps make it a less fearsome environment, and his coverage on effective use of CP/M utilities is outstanding.

Hardware

The Compleat Apple CP/M is divided into two sections. The first presents an overview of the CP/M-Apple mix along with the hardware you need. Five plug-in boards are covered in some detail, and here you glimpse a preview of the second half of the book. Rather than just a volume that details what CP/M does or that out-

lines specific procedures on how to use CP/M, Frankel instead concentrates on mini reviews of hardware and software products.

A recent addition to the cards lets you run CP/M: the Gold Card from Digital Research, the folks who invented it. (You can add this missing piece to Frankel's book by reading "Apple CP/M Cards: What's the Best Deal?" in the May 1984 issue of *Microcomputing*, pp. 66-69.)

You quickly find that you need two disk drives to use CP/M programs, as well as an 80-column card. You learn that not all hardware items will work with all others and what results you might get if you mix and match them. You find that some programs need MBasic but it comes only with Microsoft products, so if you buy someone else's CP/M card, you'll also have to buy MBasic to run certain software. Frankel tells you how the documentation is for each product he covers. One manual, he writes, is "... only about 50 pages long, and the bulk of the content is devoted to the installation procedures ...," while for another he notes that "The documentation ... is superb."

The Compleat Apple CP/M also has good advice on printers, modems and on-line services.

Software

Part 2 of *The Compleat Apple CP/M* is devoted to software, with brief mini reviews of many popular packages. Author Frankel is hesitant to name prices (they change so often) but isn't bashful about saying what he likes and dislikes. All this advice is tempered a bit by his confession on page 113 that, "No attempt was made to provide full reviews of each package." Even at that, Frankel turns up features and little tricks about a number of CP/M products that are not only fun to read about, but helpful when you use the programs.

The book covers eight word processors, ranging from Palantir to Perfect Writer to WordStar (Frankel notes that contrary to popular belief, WordStar's Cus-

tomization Manual shows how it can support proportional spacing and explains the process). Four spelling checkers are detailed, along with a couple of packages that examine your grammar. Frankel ran some of his work through one of the latter and notes that "No one had criticized my writing so viciously for at least 15 years. What's more, the program was right!" He goes on to cover a number of CP/M enhancement programs (to do such things as organize your disks), outlines four communications programs and the same number of spreadsheets and throws in a couple of statistical packages for good measure.

I always thought CP/M was particularly strong in business accounting programs, but Frankel mentions only two. He covers a few home packages and then does a good job of discussing eight database systems, ranging from Perfect Filer to dBase II.

Not Perfect?

The Compleat Apple CP/M isn't perfect. What CP/M means isn't explained until page 53, and then it doesn't match the current definition. (Other books aren't up-to-date, either: Rodney Zaks in *The CP/M Handbook* says that CP/M means Control Program for Microprocessors, and the Microsoft Softcard manual calls it Control Program/Microprocessors). None of these folks have checked with Digital Research lately—it invented CP/M and says it means "Control Program / for Microcomputers." This isn't a matter of great importance, but it seems to me that one should know what one's discussing.

The published data for specifications and prices was collected on October 17, 1983. The information in *The Compleat Apple CP/M*, then, is going to be slightly dated by the time you see it, but that's true of anything put on paper when it comes to computer hardware and software. In the real world, though, the hardware probably hasn't changed at all since then, and the software little

more. To help overcome this lead time, Frankel lists some price ranges for the boards, 80-column cards and so on, and doesn't mention any software costs.

Good Advice

On the whole, the advice in *The Compleat Apple CP/M* is good. The only way I have to judge author Frankel's accuracy is to compare his comments to my own experiences with the same products; generally, his match mine. The only remark I really take exception to is that "dBase II is easy for the beginner to master . . ." I doubt there are many who've used this package who'd consider it easy for anyone!

These few minor imperfections detract only slightly from what's really a delightful look at the world of CP/M. And when was the last time you saw a computer book for only \$12.95? If you have any interest in this area, be sure to read *The Compleat Apple CP/M*.

**Gregory Glau
Prescott, AZ**

The Microcomputer Users Handbook 1984: The Complete and Up-to-Date Guide to Buying a Business Computer

Dennis Longley and
Michael Shain
John Wiley & Sons Inc., 1983
605 Third Ave.
New York, NY 10158
Softcover, 324 pp., \$60

For all you "technocentric" folks who believe the computer world is flat, circular, made of silicon—and rotates on an axis centered somewhere in the Santa Clara valley—here is a microcomputer handbook full of information collected from outside America's silicon centers.

Fresh Look

The Microcomputer Users Handbook 1984 (it's designed as an annual publication) provides a fresh look at microcomputer technology as it's marketed and used

in the United Kingdom. This is the place where a company that expects to use microcomputer equipment in the UK can learn what's available "over there."

Unfortunately, this book is of lesser value to the rest of us "over here." Not that its information and advice are ill-conceived, but simply they didn't travel well in this instance. The authors claim that this book "is invaluable to all those involved in the computer business who require a comprehensive source of international information." Comprehensive it is—*The Handbook* is truly encyclopedic in the variety and number of topics it addresses—what it lacks is comprehensibility.

Misses Its Mark

The Handbook suffers from trying to do too much. By failing to narrow its audience, the book lost its heuristic focus. It will confound new microcomputer users and amuse old ones. A handbook for everybody, it isn't really right for anyone.

The first half of *The Handbook* serves two purposes: it gives a broad introduction to microcomputers (hardware, operating systems and other software, networking, programming, computer environment design and so on); and it offers detailed advice on how to purchase "the right system." *The Handbook* goes to great lengths—if necessarily lesser depth—to provide everything you need to know when buying a microcomputer system.

Several topics touched on by the authors deserve fuller treatment. Topics such as "writing your own applications" or "low-level languages" are highly resistant to being summarized in a few pages. And the three-page summary provided for programming in Basic would be entirely opaque to someone who doesn't already program in this language. If the book cannot be enlarged, perhaps a selective bibliography would serve to lead the reader to more detailed descriptions of these topics. *The Handbook* is at its best when it's giving advice instead of instruction. The chapters on

"How to Buy a Microcomputer" and "Effective Use of Your Computer" are quite thorough.

Time Lag

The second half of this book consists of surveys of microcomputer systems and peripheral hardware. The latest in British and European hardware is described alongside its American and Japanese competition. From Acorn to the Zytex McCombo (a British designed Z80A-based machine that runs with CP/M), more than 200 micros are reviewed. The reviews themselves are brief, well-structured, substantive (rather than critical)—and necessarily out of date. The amount of time required to reprint and distribute *The Handbook* leaves it months behind the rapidly changing American marketplace; as an example, the Osborne 1 is listed in the present tense.

Perhaps this book is limited to hardware that's currently being marketed in the UK. If so, this should be made explicit. In any case, there's no mention of the HP-150, the IBM PCjr or Apple's Macintosh—to name a few glaring omissions. Also noticeable is a lack of focus. *The Handbook* is reportedly designed for the business user; yet it reviews several systems not usually included in this market (such as the Sinclair ZX-81). In short, this book proves the need for computer magazines—periodicals that can provide real-time, focused information for the consumer.

No Gap to Fill

I suspect that this handbook was written to fill a gap in the available literature. Such a gap doesn't exist, at least in North America. Also, there are other British publications that cover the same introductory material but at a depth and in a way that teaches rather than just informs.

I can hope that next year's *Microcomputer Users Handbook* is more usable than the current version. Readers are invited to send comments and suggestions to the authors at the following address:

BOOK REVIEWS

Dennis Longley and
Michael Shain
The Microcomputer Users
Handbook
4 Little Essex St.
London WC2R 3LF

Are you planning on automating your London office this year? If so, this book is for you. The rest of us can choose from a growing list of highly useful computer manuals and magazines. Perhaps next year's *Microcomputer Users Handbook* will be among these.

Bruce Caron
Santa Barbara, CA

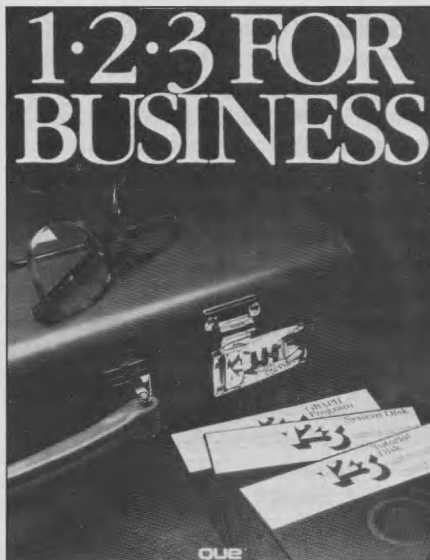
1-2-3 for Business

Douglas Cobb and Leith Anderson
Que Corp., 1984
7999 Knue Road, Suite 202
Indianapolis, IN 46250
Softcover, 338 pp., \$14.95
Software sold separately, \$79.90

Since the introduction of the IBM PC and PC-compatibles, many software packages and hardware items have been developed for home and business applications. One software package that's become increasingly popular with IBM PC users is Lotus 1-2-3 by Lotus Development Corp. It's a unique program package that includes an electronic spreadsheet, a database and graphing capabilities, all in one.

Get the Most

Now, because of extensive program packages like Lotus 1-2-3, dBase II and other after-market IBM PC support products, you may learn how to get the most from your computer hardware and software purchases from over-the-counter help books. One such book is *1-2-3 For Business*, published by Que Corp.—a book of fourteen spreadsheet models (or templates) for the Lotus 1-2-3 business user. The book includes some lengthy business application templates, each with a description of the application and instructions on how to apply the spreadsheet to your business needs. The book



is reasonably priced (\$14.95) for the amount of information that comes with it. If you don't feel like typing the templates into Lotus, then you have the option of purchasing a disk with the templates already typed and tested for you. The catch is that the disk will cost you \$79.90.

Slight Catch

And it certainly is a catch worth mentioning. Although the book is packed with interesting business applications such as a cash flow template, a checkbook management template and a loan amortization template, once you open it to the page where the template resides, you're in for a shock. Unless you have ten/ten vision (because 20/20 won't do at all), you won't be able to read the template listing. It's printed way too small. So, if you really want to use these templates, you should purchase the software available on disk from the publisher.

I'm sure that some ambitious computer hobbyists will attempt to type the spreadsheet models into their computers. Maybe after several hours of debugging, lots of typing mistakes and using a bottle or two of soothing eye drops, one or two of the templates will run.

But, I wouldn't bother trying to fight the tiny printing. If you feel the applications fit your business

needs, then go ahead and buy the disk. It'll save you several days or even years of typing, not to mention the debugging.

Typical Template

A typical template might be six to eight pages with approximately 152 lines on each page. It's almost impossible to keep your place when you're trying to type the lines in, since the letters are so small. And to add insult to injury, the listings are printed with a dot-matrix printer, which would make it more difficult to read even with normal-size print.

Another problem is the appearance of the sample outputs of the templates. They are also printed in tiny text in an almost impossible-to-read dot-matrix format.

But all is not lost. Aside from the small, hard-to-read template listings and sample outputs, the instructional text in each chapter is typeset nicely and is readable. The instructions required to perform Lotus functions, like copying the contents of a cell to another cell or displaying a graph, are set aside in a space below the text on a separate line. In this format, the first letter of each required command is set in bold type. Along with a description of the template's use, most of the chapters include a section on modifications

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for the spreadsheets and a conclusion to sum up what you've done with the template.

Some Basics

If you're considering buying 1-2-3 For Business as a beginner's guide to Lotus, I suggest that you reconsider. Although the authors suggest that the book would be helpful for both the beginner and advanced Lotus user, I find that most of the material isn't at a beginner's level. The book doesn't offer a step-by-step approach to learning how models are constructed. Although a description is given, this description is more suited to the advanced Lotus user.

In fact, the introduction tells you to refer to the Lotus 1-2-3 manual for basic instructions and reference. It assumes that you understand the basic concepts of Lotus and are familiar with its operation.

Getting Started

The introduction presents the spreadsheet models included in the book and some Lotus basics. It assumes that you understand "the concepts of rows, columns and cells; the use of addition, subtraction, multiplication and division of 1-2-3; and the commands /Copy, /Range, /Worksheet Insert

and Delete, /Graph and /Data." This confused me because on the previous page of the introduction it was stated that this book was for either the novice or advanced Lotus user or even anyone considering purchasing Lotus for business use. I don't understand how a business applications book can help you learn how to use such a complex program as Lotus.

Next, the authors describe some of the typical Lotus conventions such as entering cell references, recalculating, printing, saving and loading the spreadsheet and setting column widths.

Despite my criticisms, the book has a lot to offer the advanced Lotus user who is looking for some useful business applications. Twelve of the 14 spreadsheet models are quite complex and probably would be most useful to a person who uses a computer, along with Lotus 1-2-3, for managing cash flow, tracking a line of credit, fixed asset management, debt financing, projecting cash flow, calculating growth capacity and managing accounts receivable. All those applications mentioned and more are included in spreadsheet format for use with your personal computer.

Now the Templates

Each template has its own chapter beginning with the managing cash flow model in Chapter 1. This template is one of the few shorter models, requiring only four pages of tiny text to be typed in. I finally finished typing the 3½ pages in about 3½ hours (not all at once, thank you). I used all caps for the text headings so I could type faster. Every so often I would make a mistake and have to correct a formula, but generally, I was typing efficiently with almost no errors. After finding only one problem with the formula at cell A17 and then quickly fixing it by following the directions in the text, I had my template up and running.

No Surprise

I wasn't surprised that it

worked, since most books that have software available on disk must have gone through a lot of program testing and debugging before the listings were published. And sure enough, my output matched the sample output. What I found next was a simple but useful spreadsheet for keeping track of cash receipts and expenses. The template was really designed for the homeowner, with entries allowed for weekly salary and cash expenses, mortgage payments, credit card expenses and car repair costs, although the spreadsheet could be modified for any type of expense entry or changed for use with business cash flow applications.

I found the template easy to use with the text thoroughly describing its application. Included were suggestions for using the model to make predictions on future expenses or receipts. I also followed the instructions for creating a graph from the template, giving a line graph of monthly cash flow from the data entered.

In general, I found each chapter in this book to be clear and understandable with the author's instructions for using the spreadsheets easy to follow. Many of the chapters had short sections on how to modify the model for your own particular application, although these sections were usually no more than one or two pages giving minimal information.

Buy Book and Disk

I'm sure that a business person would benefit by buying 1-2-3 For Business because most of the templates are for business use, but I recommend purchasing the disk that goes along with the book. I don't think the book would be useful for a beginner to Lotus, though a nonbusiness person may find some of the templates useful for money matters around the home, such as managing and projecting cash flow, amortizing a loan and managing a checkbook.

Howard Berenbon
W. Bloomfield, MI

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BOOK REVIEWS

From the MC Bookshelf

If you wish to discover how useful on-line databases can be and want a quick reference to readily available databases in the nation indexed by subject matter, *The Reston Directory of Online Databases* by Jay M. Schafritz and Louise Alexander (Reston Publishing Co. Inc., 11480 Sunset Hills Road, Reston, VA 22090; \$17.95) should be helpful to you.

If you believe that "know thine enemy" is good advice, you may be interested in reading *Out of the Inner Circle* by "The Cracker," the teenage computer wizard wanted by the FBI (Microsoft Press, 10700 Northup Way, Box 97200, Bellevue, WA 98009; \$16.95). The "Inner Circle" is a group of teenage hackers in the United States who spend their evenings trying to crack military and business computer systems. Even if you're not the system operator of a mainframe or mini-computer, perhaps you'll enjoy a look at the specific security flaws of large systems and large data networks.

Ashton-Tate (10150 West Jefferson Blvd., Culver City, CA 90230) has introduced a series of books designed to provide user information about Framework, the integrated software package. The five-book series will cover Framework for all levels of users from the novice to the advanced programmer. Titles are: *Framework: An Introduction* by Bill Harrison (\$15.95); *Framework: On-the-Job Applications* by Expert Systems Inc. (\$19.95, with disk \$29.95); *Framework: A Programmer's Reference* by Forefront Corp. (\$24.95); *Framework: An Introduction to Programming* by Forefront Corp. (\$19.95); and *Framework: A Developer's Handbook* by Forefront Corp. (\$24.95).

Two offerings from Osborne McGraw-Hill (2600 Tenth St., Berkeley, CA 94710) are *Multiplan: Home and Office Companion* by Elna Tymes and Peter Antoniak (\$15.95) and *MS DOS User's Guide* by Paul Hoffman and Tamara Nicoloff (\$17.95). The

How can you benefit from the technological revolution? *Harnessing Information Technologies: A Guide for Business and Professional People* by Carolyn J. Mullins and Thomas W. West (Prentice-Hall Inc., Englewood Cliffs, NJ 07632; \$10.95) claims to be "a superglossary of those terms and topics you always wanted to know about but didn't know whom to ask." first offers a collection of ready-to-run models covering both professional and personal applications. The second covers every version of MS DOS, describes the software that runs under MS DOS and other products that enhance the operating system.

The C Programming Tutor by Thomas O. Sidebottom and Leon Wortman (Robert J. Brady Co., Bowie, MD 20715; \$17.95) "unveils the mysteries of the C programming language for the first time in step-by-step tutorial fashion." It includes simple and complex programming examples to reinforce C concepts.

Digital Communications Programming on the IBM PC by W. David Schwaderer (John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158; \$47.90), a book/disk set, is a guide to mastering programming techniques for creating individualized software in any communications environment. The book includes extensive demonstration programs written in Basic illustrating key concepts. These are available on the program disk for immediate application.

If you need money to support your computer habit, Warner Books (666 Fifth Ave., New York, NY 10103) has published *The Complete Software Marketplace: 1984-85* (\$17.95) by Roger Hoffman. This guide is supposed to "teach personal computer users how to turn ideas into programs and how to sell these programs—either to software companies or on their own directly to the public." Whatever turns you on!

N.K.

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EXPRESS CHECKOUTS



Sord IS-11

Manufacturer: Sord Computer of America Inc., 645 5th Ave., New York, NY 10022.

Price: \$995 (with 32KB RAM, 64KB ROM with spreadsheet, word processing, database, RS-232C communications and graphics software; microcassette drive).

When the Sord IS-11 arrived at the *Microcomputing* offices, it impressed no one; I joked about a review—"not only the worst computer, but possibly the worst product ever announced." Then Sord sent a little utility that made the IS-11 run twice as fast. I spent some time with it, saw how well it handled spreadsheets, and I mellowed toward it somewhat. Then I saw Epson's PX-8, with twice the memory, RAM disk capability, an 80-column screen and WordStar for the same price, and forgot about the Sord altogether.

The Sord's "IS" stands for "integrated software"; it's the only briefcase portable that can shuffle spreadsheet tables, memos, a four-function calculator and pie or bar charts in little windows on its 8 x 40 LCD screen.

Its built-in programs are clumsy—after setting up a worksheet's rows and columns with the Create command, you're back at the system prompt and must enter the Write command to fill them in—but there

are lots of options for spreadsheet design and analysis. Though one of its word processors is a bare-bones, backspace-to-edit affair, the other is a decent imitation of the TRS-80 Model 100's.

As for hardware, the Z80A-based Sord fills its 32KB RAM in a hurry; a microcassette drive supplies leisurely mass storage. Nicad batteries power the unit for eight hours, but it's wise to carry the ac recharger at all times—when the low-battery warning appears, you have one minute before the Sord shuts off and one to five hours before your data is lost.

The IS-11's keyboard has the sound and feel of a toy piano. And, even with the speedup utility, the Sord is painfully slow. It takes about 30 seconds to load a four-paragraph memo—pushing a function key, waiting for the screen to give the next prompt, pushing another, typing the filename and waiting for the file to load from RAM.

To compound that, the integrated software system is like an awkward DOS compared to other portables' easy menus. Viewing a directory of RAM files requires pressing a sequence of five function keys; you can bypass them by typing the command directly—Titles;Memory;No[specific filename] or T;M;N—but it's still no match for the menu that appears when you turn on the Model 100.

Against such difficulties, skill with spreadsheets isn't enough. Briefcase-sized integrated software is a good

idea, but the Sord would be too slow and clumsy at half its price.

E.G.

Transylvania

System Requirements: Apple Macintosh.

Manufacturer: Penguin Software, 830 4th Ave., PO Box 311, Geneva, IL 60134.

Price: \$39.95.

MacPaint is wonderful, MacWrite is serviceable and there are a few Microsoft products and desk calendars, but your smug PC-owning friends are asking "Where's all the other Macintosh software you've been promised—in the Twilight Zone?" Not exactly, you say. One program's in Transylvania.

Penguin Software's Transylvania is a semiclassic Apple II adventure game, with simple two-word commands and vivid graphics showing your quest to save the kidnapped Princess Sabrina. The Macintosh adaptation restricts the pictures to the top left quarter of the screen while the right half is for text descriptions, news bulletins ("A grim chuckle erupts behind you") and your responses.

The lower left corner shows a diamond with the four compass directions, bringing the Mac's mouse into play: clicking on the N point of the diamond, for instance, is Mac-Shorthand for typing "go north." It's no quicker, however, than using keyboard abbreviations (pressing N and the return key); there are no mouse commands for moving up and down, and you have to type nonmovement commands like "go house" or "get pistol" anyway.

The Mac environment is better served by Transylvania's pull-down menus. One checks your inventory (a frequent habit for seasoned adventurers); another lets you save or restart one of five games in progress. Either there was a slight bug or we broke



EXPRESS CHECKOUTS

our review copy's save feature—it worked about two-thirds of the time—but the other pull-downs, such as Cut and Paste commands for text or access to desk accessories like the Calculator, Control Panel or Puzzle, were fine.

The mouse is useful (so are the three hungry mice in the story) and the graphics are sharp—though some dramatic scenes are just described, not shown—but the real value of Transylvania lies in its plot. Its terse commands and limited vocabulary are no match for Infocom's text-only adventures, but you'll have fun fending off the werewolf, trying to find what's in the empty cabin and wondering where Sabrina is, let alone how you'll manage to save her life.

The first three-quarters of the game are best; our adventure-cracking copy editor was unhappy with the last part, which shifts from ghouls and vampires to E.T. and *Close Encounters* in an anticlimactic finale. Still, if you have a Mac and want a few hours' pleasant pastime, Transylvania delivers some spooky fun, logical puzzles and occasional surprises. Look for the silver bullet.

E.G.

Corona PPC-2

Manufacturer: Corona Data Systems, Inc., 275 East Hillcrest Drive, Thousand Oaks, CA 91360.

Price: \$2595 (with 256KB RAM, dual floppy drives and nine-inch 400 × 640-pixel high-resolution screen).

Manufacturing a successful IBM-compatible transportable is as easy as baking a Betty Crocker cake. All you do is take the proper ingredients (in this case an 8088 processor and two double-density disk drives thrown in with 256KB of RAM and a full-screen monitor), mix gently and place into the appropriate container. Include a keyboard that packs up easily, stick a handle on it somewhere and sell it at a price below the original. Right?

Wrong. Although the basic recipe is right, unless you put care and planning into the mechanics of baking, your end product may be edible, but it won't qualify for the bakeoffs. Such is the fate of Corona Data Systems Corona PPC-2. It has all the right ingredients—some are of superior quality (i.e., the 640 × 325-pixel high-resolution graphics screen). But this transportable won't win any ribbons at the county fair.

My biggest complaint about the Corona PPC-2 is the physical design and workmanship. Let's face it: the contest among portable clone manufacturers centers around who can best put an IBM PC in a neat suitcase-sized package. But Corona seems to sacrifice durability and convenience in order to keep the cost down. The Corona sells for \$2595, \$425 less than its IBM match.

The keyboard cover, which doubles as the bottom of the machine when it's packed up, attaches to the main unit via two flimsy plastic-hinged clamps. The plastic clamps are already showing signs of wear, and when the hinges open or close one too many times, the portability of the machine will be virtually lost.

Another problem with the computer's portability stems from its thin one-piece metal handle. I don't know why Corona decided to mount the handle sideways—it makes lugging this 38 lb. unit a shin-splitting experience.

My demo unit came complete with casing that doesn't fit snugly, a crookedly installed monitor and one wobbly, adjustable keyboard leg. (It fell out of its socket when I opened the machine for the first time.) When packed up, the parallel and serial ports, on/off and reset buttons and fan port are all on the top and naked to the elements.

The only way to adjust your viewing angle is to pull out an easel-like bar from underneath the computer that raises the front a whopping four inches off the tabletop. There is no in between. Last, to access the main board's four available expansion slots, you have to unscrew the entire unit and lift the back cover just high enough to peek in. "Raising the cover too high," the manual warns, "can cause the front bottom tabs to break."

Don't get me wrong. The Corona isn't a bad machine. Functionally, it operates as any clone should, and it has a corrected IBM-style keyboard with a wonderfully long cord. It's a good computing value when you consider the bundled GW Basic, DOS 2.0, MultiMate 3.2 and PC Tutor. But if I'm in the market for a portable machine, I don't want one that's wretchedly difficult to carry, one that might fall apart on me or one with few adjustments for my physical comfort. If I'm going to spend more than \$2500 for MS DOS-to-go, I want to be able to have my cake and eat it too.

A.C.

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CALENDAR

November 1-4 La Jolla, CA

Writers, programmers and anyone else interested in publishing should welcome the opportunity to attend **Bits, Bytes and Books: The First Annual Computers and Publishing Conference**. The extension division of the University of California, San Diego, is sponsoring the conference, which will feature workshops, seminars and discussion groups.

Topics to be discussed include software and computer books, author-editor relationships, writing teams and computer magazines. Representatives from several noted periodicals and publishing companies comprise the faculty for the conference. For more information, contact UCSD Extension, X-001/University of California, San Diego, La Jolla, CA 92093; 619-452-3430.

November 1-4 Boston, MA

The home of the bean and the cod will also be the home of the seventh annual **Northeast Personal and Business Computer Show** November 1-4. Boston's Hynes auditorium will fill with more than 500 booths and displays of personal and business computers, software, accessories, peripherals and publications.

For further details, contact Northeast Expositions, 822 Boylston St., Chestnut Hill, MA 02167; 617-739-2000.

November 2-4 New York, NY

The New York tri-state area is the geographic focus of the first annual **Regional Educational Software Symposium**, which will be at the Penta Hotel in New York City November 2-4. The symposium is designed to aid parents and teachers in the metropolitan area in evaluating and choosing computers, software and educational directives for their children.

Topics will include software evaluation criteria, the computer as a problem-solving tool, when children are ready for computer education, and the home entertainment center as a learning environment. Hands-on demonstrations and workshops will also be a part of the proceedings. For more information, telephone Nina T. Kurtis at 212-688-8904.

November 2-4 Washington, DC

The American Association for Medical Systems and Informatics will convene in Washington for its third annual conference, **Medical Computing: Keeping Current**. The conference will offer professional specialty group sessions and meetings, computer theater software exchange demonstrations, a wide spectrum of two-day seminars and "luncheons with the experts."

The experts will lead two-day seminars on local area networks, medical education computing, office information systems, and hospital operations and new management systems. For registration information, contact The American Association for Medical Systems and Informatics, Suite 402, 4405 East-West Highway, Bethesda, MD 20814.

November 2-4 Jacksonville, FL

The Veterans Memorial Coliseum is the site for this year's **Jacksonville Business and Office Showcase**, one of the Great Southern Computer Shows. The event will offer all comers a chance to inspect the latest hardware and software as well as peripherals, accessories, data communication equipment, telecommunications equipment, computer furniture and more.

For more information, contact Great Southern Computer Shows, PO Box 655, Jacksonville, FL 32201; 904-356-1044.

November 3 and 4 Tucson, AZ

Students of the Management Information Systems Department of the University of Arizona will host the third annual **Tucson Computer Fair** on November 3 and 4. The show will display both hardware and software for business, home, personal and entertainment purposes.

More information on the fair is forthcoming from Janeen Woodbury, Marketing Director, Tucson Computer Fair, SUPO Box 20826, Tucson, AZ 85720.

November 4-7 Washington, DC

Physicians, nurses, administrators and other interested medical personnel will gather at the Washington Hilton Hotel in Washington, DC, for the eighth annual **Symposium on Computer Applications in Medical Care** November 4-7.

The symposium will cover a plethora of medical applications of computers, discuss processing and communications in the medical field and explore problem areas and new opportunities. Events include paper presentations, demonstrations of applications and methods, panels, workshops, a software exchange and a student paper competition.

For further details, contact Gerald S. Cohn, SCAMC—Office of CME, George Washington University Medical Center, 2300 K St., NW, Washington, DC 20037; 202-676-8928.

November 4-7 Anaheim, CA

John Roach, president, chairman and chief executive officer of Tandy Corp., is slated to deliver the keynote

CALENDAR

address of the Data Processing Management Association's **DPMA Anaheim '84 International Computer Conference and Business Exposition.**

Roach will speak on "Micro: A System Alternative." In addition to the keynote address, the conference will offer more than 60 seminars, workshops and special seminars. Nearly 240 booths will complement the conference proceedings. All events will be at the Disneyland Hotel Convention Center. For further details, contact Conference Manager, DPMA International, 505 Bussee Highway, Park Ridge, IL 60068-3191; 312-825-8124.

November 5-13 Beijing, China

This year's **China Comm '84** has been expanded to include exhibitions from European and Asian companies as well as American firms. The show, scheduled to be at the Beijing Exhibition Center November 5-13, is billed as the first "truly international exhibition of its kind ever staged in China."

The exhibition and conference will cover telecommunications, electronics and computers. The Chinese government is in full support of the program, stating the Ministry of Post and Telecommunications plans to spend between two and three billion dollars on imported products by the end of 1985.

For more information on **China Comm '84**, contact Clapp and Poliak International, PO Box 70007, Washington, DC 20088; 301-657-3090.

November 6-January 6 Lansing, MI

The Impression 5 Museum is one of nine museums across the country that will house the traveling micro exhibit **Chips and Changes**. The exhibit depicts how computer chips are made and how they work, as well as exploring newly developed and emerging applications.

The exhibit has been designed to be hands-on and interactive and features live demonstrations, computerized polls, audiovisual presentations, and six free-standing displays related to health, factory robots, educational games, home computers, paperless offices and smart tools. For more information on the Michigan tour stop, contact Impression 5 Museum, 200 Museum Drive, Lansing, MI 48933; 517-485-8115. For more information on where the show will be after January 6, contact ASTC at 1413 K St., NW, Washington, DC 20037; 202-371-1171.

November 7 Miami, FL

The University of Miami's Intelligent Computer Systems Research Institute is sponsoring a one-day colloquium,

"Artificial Intelligence—Opportunities and Limitations in the '80s." Nobel Laureate Herbert A. Simon will discuss advances in AI for business, industry, medicine and the "man on the street" in his keynote address.

The colloquium will be at the University of Miami/James L. Knight International Center November 7. For more information about the colloquium, call Coordinator Jonathan D. Lynch at 305-284-5195 or write the ICS Research Institute, University of Miami, PO Box 248235, Coral Gables, FL 33124.

November 7 and 8 Battle Creek, MI

"Managing Information in the '80s" is the theme of this year's **Logosystems '84**, a seminar and product show sponsored by the Information Management and Processing Association.

Seminars will be offered on OIS training, word processing operator training, PC integration, the impact of electronics on office environments and stress management. The product show will feature hardware and software displays as well as peripherals and supplies. The show will be at the Stouffer's Battle Creek Hotel. For more information, contact Marilyn Miller at 517-655-2756 or write to **Logosystems '84**, PO Box 16267, Lansing, MI 48901-6267.

November 7 and 8 Jacksonville, FL

The Jacksonville chapter of the Data Processing Management Association announces that its fifth annual **DPMA Vendor and Trade Show** will be November 7 and 8. The Sheraton Inn, St. John's Place, Jacksonville, will house the event.

For more information, contact DPMA, Jacksonville Chapter, PO Box 272, Jacksonville, FL 32201.

November 8-11 Chicago, IL Philadelphia, PA

The **Computer Showcase Expo** offers two shows at the same time—November 8-11, the show will be simultaneously in Chicago at McCormick Place and in Philadelphia at the Philadelphia Civic Center.

Both shows, which are geared toward business, professional and corporate users of small computer and word processing systems, feature displays of hardware, software, small systems, peripherals and supplies as well as the Small Computer College, which offers advanced seminars at no additional charge to attendees.

For more information, contact the Interface Group, 300 First Ave., Needham, MA 02194; 800-325-3330 or, from within Massachusetts, 617-449-6600.

CALENDAR

November 9 and 10 East Peoria, IL

The Holiday Inn in East Peoria, IL, will house the 23rd annual **Illinois Association of Electricity, Electronic Educators Convention/Workshop**. Workshop topics include industrial electronics, microprocessors and digital electronics. For more information, contact Robert Bloompott, Illinois Central College, East Peoria, IL 61635; 309-694-5495.

November 11-14 Reno, NV

The Special Interest Group for University and College Computing Services (SIGUCCS) will hold its 12th annual **ACM SIGUCCS User Services Conference** November 11-14 in Reno. This year's conference will offer a new series of tutorials, paper presentations, panel discussions, special documentation exhibits, trips to local companies and more.

The conference is sponsored by SIGUCCS as a forum for discussing computing in higher education. Interested persons should contact Ellen Jacobson, SIGUCCS 1985 Conference Chair, UNS Computing Center, Computing Center Building, Reno, NV 89557-0023; 702-784-4342.

November 11-14 San Francisco, CA

"The Information Age: New Actors, New Factors" is the theme of the Information Industry Association's 16th annual **IIA Conference and Exhibition**. Work sessions will emphasize future markets and technological innovation. Non-IIA members are welcome to attend. For more information, contact the Information Industry Association, 316 Pennsylvania Ave., SE, Suite 400, Washington, DC 20003; 202-544-1969.

November 12-14 Chicago, IL

Keynote speaker J. David Hann, president of GTE Tele-net Communications, will address more than 1000 attendees at the 11th annual **Computer Security Conference and Exhibition**. The conference, sponsored by the Computer Security Institute, will feature 60 workshops, nine general sessions, a "graduate program" for advanced practitioners, special interest sessions and more.

For registration information, contact Carol Smith at Computer Security Institute, 43 Boston Post Road, Northborough, MA 01532; 617-845-5050.

November 14 and 15 Portland, OR

The Northwest Regional Educational Laboratory will wrap up its workshop series with two dates this month—November 14's workshop will address workshop skills for the computer coordinator and November 15's meeting will cover technical skills.

The entire series of workshops is designed for people involved in computer decisions for individual schools or school districts. For more information, or to have a workshop series held in your area, contact Jim Pollard, NWREL Computer Technology Program, 300 SW Sixth Ave., Portland, OR 97204; 800-547-6339 or, from within Oregon, 284-6800.

November 14-16 Chicago, IL

If data communications is your bag, take note—the Software Institute of America is sponsoring **Data Communications: Network Design, Integration and Applications** November 14-16, and the title says it all. Specific topics the seminar will cover include network alternatives, intra-premises communications, the language of data communications and protocol selection. Stephen Howard of Boston University will lead the seminar.

For more information, contact Software Institute of America Inc., 8 Windsor St., Andover, MA 01810.

November 14-18 Las Vegas, NV

The rites of autumn are upon us—**Comdex/Fall '84** will once again hit Las Vegas November 14-18. This year's show has expanded even further—proceedings will take place at the Las Vegas Convention Center, The West Hall, Caesar's Palace, The El Morocco Motor Lodge, Las Vegas Hilton Hotel, MGM Grand Hotel, Riviera Hotel and the Sahara Hotel.

For further Comdex information, contact the Interface Group, 300 First Ave., Needham, MA 02194; 800-325-3330 or, from within Massachusetts, 617-449-6600.

November 15 and 16 New York, NY

The Big Apple will play host to **IMS and DB2: IBM Database Strategies** November 15 and 16. The seminars will cover everything from database concepts to management implications of fourth generation database technology and will include a comprehensive evaluation of DB2.

A similar conference will be held in Atlanta in January for those unable to make the New York date. For more information, contact Software Institute of America Inc., 8 Windsor St., Andover, MA 01810.

CALENDAR

November 16 and 17
Palo Alto, CA

November 23-25
Pacific Grove, CA

The industrious Forth Interest Group is convening yet again—this time for the sixth annual **Forth Convention and Banquet**. FIG members and others interested in the latest developments and applications of Forth will gather at the Hyatt Palo Alto for exhibits, vendor booths, hands-on tutorials, lectures and seminars.

Later in the month, the **Forth Modification Laboratory Conference** will discuss expert systems and artificial intelligence. The conference will be at the Asilomar Conference Grounds in Pacific Grove.

For more information on the convention, the conference or FIG in general, call the FIG hot line at 415-962-8653 or write FIG, PO Box 1105, San Carlos, CA 94070.

November 18-20
West Lafayette, IN

Chips on the farm? You bet—November 18-20 have been reserved for Purdue University's **On-Farm Computer Use Conference and Trade Show**. The conference is designed specifically for agricultural computer users. For more information, contact Purdue University, Agricultural Engineering Building, West Lafayette, IN 47907; 317-494-1167.

November 21-23
Sydney, Australia

November 26 and 27
London, England

The International Database Management Association has planned two **International Spectrum** shows this month with the intention of bringing knowledge of Pick to a gathering crowd of enthusiasts. The **Spectrum** shows are designed to be a forum for Pick-based manufacturers, distributors and systems houses.

The show will be in Sydney, Australia, on November 21-23 and will travel to London on November 26 and 27. For information on the Sydney show, contact IDBMA c/o Vic Sergie, PO Box 77, Gympie, NSW 2227, Australia; telephone 02 570-5505. Information on the London show can be obtained from IDBMA, Chris Holman, PO Box 32, Morthwood, Middlesex, England HA6 1HZ; telex: 837535.

November 26-28
San Francisco, CA

If you've been lost in a graphics sea trying to decide how to select the best graphics hardware and software, help is here in the form of a seminar sponsored by Technology Transfer Institute. **"Computer Graphics for Business"** will be taught by Alan Paller, president of AUI Data Graphics. The user-oriented seminar will include case studies examining success and failure of business graphics systems. For more information, contact 741 Tenth St., Santa Monica, CA 90402; 213-394-8305.

CLASSIFIEDS

FOR SALE: Sanyo 550, IBM compatible, 128KB, one drive, 12-inch amber monitor, WordStar, CalcStar, Color Basic, \$870. Raymond Laracuenta, 386 Sigwin Drive, Fairfield, CT 06430; 203-255-3170.

FOR SALE: CP/M-80 Teletex Z80 system with 64KB. Complete chassis with P.S. Visual 50 display, two 5.25-inch floppy, 700KB each. MPI 88G FTR. All cables and lots of software for \$2200. Dhiren Shah, 234 Nardone Road, Needham, MA 02192; 617-444-5873.

FOR SALE: Citron II, Apple compatible, \$700. Sanyo 1250 business computer with Accounting Partner software and WordStar, MailMerge, CalcStar, ReportStar, \$2500. Pat Bickford, 1340 17th St., Los Osos, CA 93402; 805-528-0248; 805-543-2700, ext. 7984.

FOR SALE: Run Apple programs on your Z80 bare board, \$35. Write to Eric Singh, 2419 Pace Blvd., Suite 53, New Orleans, LA 70114.

FOR SALE: Gimix 6809 system, 120KB RAM, dual 5¼-inch DS DD disks, dual eight-inch DD disks, four serial ports. Flex, OS-9, Introl C, RMS, Super Sleuth, lots more software. Contact Phil Hughes at 206-367-8649.

FOR SALE: Decision Manager integrated software package by Peachtree Software. Brand new, never opened, won in a raffle drawing. The software includes a word processor, spreadsheet, graphics and database functions and can communicate with microcomputers and mainframes. Decision Manager runs on the IBM PC, \$425 (list \$625). If interested call or write. David Ferrante, RR #1, Box 477, Antrim, NH 03440, 603-588-2615.

FOR SALE: Complete set of *Kilobaud Microcomputing*. Best offer, or will barter for food, clothing and shelter. Contact The KB Kids, 80 Pine St., Peterborough, NH 03458.

FOR SALE: Used Texas Instruments 763 silent 700 printing terminal with 20KB bubble memory, RS-232C, works well. Best offer—at least \$500. Contact Irving Wolfe, 206-282-9598.

WANTED: *MAD Magazine/National Lampoon*-type editorial and cartoon material for national magazine targeted to kids with Apple computers. Send inquiries to Emerald City Publishing, PO Box 582, Santee, CA 92071.

FOR SALE: TRS-80 Model III Computer. 48KB RAM, two disk drives, printer cable, daisy-wheel II printer, SuperScript, Series I Editor Assembler (disk) and numerous programs on disk. Asking \$2200 for the package (negotiable). Includes original packing, manuals, books and magazines. Mark Paulhus, 52 Dwight St., New Britain, CT 06051 or 203-224-3309.

WANTED: Sharp PC-1500 pocket computer users who want to know how to convert your PC-1500 into a PC-1500A, how to extend its RAM, how to speed it up, how to define your own special characters for display, plotter and keyboard. For details, write to Christian Germelmann, Hauptstrabe 95, 3422 Bad Lauterberg 1, Germany.

FOR SALE: ADDS terminal model CONSUL 980-A. Best offer secures. Herbert, PO Box 725, New Brunswick, NJ 08903.

WANTED: College student would appreciate donation of used Timex/Sinclair computer and equipment. For class project. Will pay all postage. Imre Auersbacher, 41 King St., A2, Belle, NJ 07109.

FOR SALE: To highest bidder. DEC VT 180, four disk drives, DEC LA34 printer (Select, Multiplan & Basic Plus CP/M). All are now in use. J.M. Newman, 23 Trent Lane, Smithtown, NY 11787.

FOR SALE: Heath H-89, 64KB RAM, modem, single 100KB 5¼-inch disk drive, Microsoft Basic, CP/M, HDOS. \$1350 or make offer. Bill Bettger, c/o M.B.C., 1001 E. Main St., Newark, OH 43055; 614-345-6708 or 614-349-9712.

FOR SALE: Heath H-89 computer, peripherals and software. 48KB, two H-17 hard-sector drives, three serial ports. H-14 dot-matrix printer. Software includes: CP/M, SuperCalc, ZED, Basic, Pilot, Macro-80, General Ledger, Inventory, several games. All manuals. Also cassette interface board with manual and tapes. Send offer to Bob Kerns, 913 Wheaton Road, Fredericksburg, VA 22401; 703-786-4377.

WANTED: Cheap used computer, disk/cassette, and/or printer for local church word processing and mailing list. (Donations are tax deductible.) Howard Mesick, RD Box 299-1, Hartly, DE 19953.

FOR SALE: \$50 buys CoCo (TRS-80) multiport, holds four ROM paks with DOC & power. Bob Green, 404-451-9813.

FOR SALE: Disk drives, *Micro*, 80 *Micro*, *Kilobaud*, *Byte* magazines, \$30/year. Winters, 7 Fawn Lane, Hilton Head, SC 29928.

FOR SALE: Hazeltine T120/120 printer. Prints 120 cps. \$150. Ask for Chris, 212-978-6745.

FOR SALE: KIM-1 microcomputer with homebuilt box, 4KB RAM expansion, RS-232C board, power supply and complete documentation. \$110 includes shipping. Roger Alford, 2633 Braeburn Circle, Ann Arbor, MI 48104; 313-973-9763 or 313-426-3935.

FOR SALE: S100 static memory boards: Compupro—2 xRAM IV (16KB) & 1 xRAM IIa (8KB), all 4 MHz, used but excellent working condition. Asking \$100 for 16KB and \$75 for 8KB or best offer. Also Industrial Microsystems 2 x 8KB at 2 MHz (uses 2102s) \$50 each or offer. Back issues *Creative Computing*, 1982 to present—\$1.50 each. Contact Arnold Cohen, 41-34 52nd St., Apt. 3L, Woodside, NY 11377; 212-446-0399.

FREE: WordPro 4 Plus for the CMDR 8032 computer. I will send this software to any non-profit educational organization desiring it. Send inquiries to Allan Senkow, PO Box 2913, Los Angeles, CA 90051.

FOR SALE: APPLE II Computer, peripherals and software. Disk II, Micromodem II, Epson MX-80FT Plus, Lazar L.C. Plus, Applesoft ROM and printer card. \$2000 or best offer. Frank Hart, 1131; Tioga Trail, Willoughby, OH 44094; 216-831-6000; 216-951-2116.

WANTED: Serious computer science major would appreciate unwanted computer hardware. Will pay shipping. Call collect 202-667-0219.

It's a small first step, but important: Commodore Business Machines, under pressure from the Federal Trade Commission, has promised to make no false claims about a product's capabilities and to refrain from advertising any item not available in reasonable quantities.

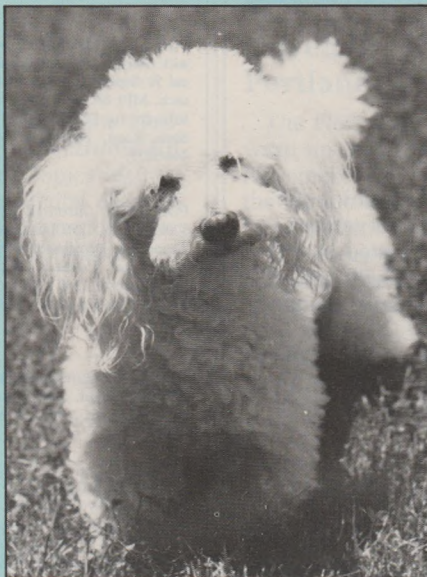
The FTC action stems from ads for the Commodore-64, introduced in August 1982 with promises of an optional Z80 expander able to run thousands of CP/M programs. According to FTC spokesperson Linda Singer, the unit didn't appear until the summer of 1983, upsetting consumers to whom—in a phrase perhaps more quaint than true today—"CP/M could be an important factor in deciding whether to buy a home computer."

The FTC/Commodore agreement went on 60 days' public record in August; if the commission decides to make it final, Commodore can be fined up to \$10,000 for each violation. Considering that Comdex booths and four-color spreads for next year's products are now standard, that "vaporware" has become a buzzword and that MacWorld's software reviews have won it honor as a fiction magazine, the FTC precedent could upend the industry.

In the midst of the FTC settlement, Commodore President Marshall Smith promised a Macintosh-like micro at "well under \$1000." It's not false advertising: the firm has bought Santa Clara, CA's Amiga Corp., a former joystick maker preparing a 68000-based home computer with built-in applications and color graphics software.

Atari, now headed by Commodore founder Jack Tramiel, promptly sued Amiga, claiming the smaller company backed out of an agreement to sell Atari three advanced graphics chips. The chips are reportedly essential to the new computer—which, gossip has it, Atari wanted to market itself.

Samna Corp. has won the hearts of users and bared its throat to pirates, removing copy protection from its Word I, II and III word processors. The Atlanta company cited the increasing use of RAM disks, which give fast storage but must be refilled



Small dogs: An endangered species due to killer robots?

every morning, and extra convenience for dealer demonstrations.

The Samna software retains its single-user license agreement; a serial number and the owner's name will be recorded on the original copy (\$295-\$550) and all backups.

"News Window" has nothing but respect for Byte, but our crosstown rival mistimed its special "Guide to the IBM Personal Computers." Publishing deadlines precluded mention of July 31's impressive PCjr improvements, while the lead article, adapted by Strategic Inc.'s Michael Killen from a December 1983 market survey, declared "Future [IBM micros] may feature faster memory and processors, but this is unlikely before 1987 or 1988." Subscribers received the magazine on August 13, the day before Big Blue unveiled the 80286-based PC AT.

This month's best press release comes from Lawrence Gasman of International Resource Development, who directed the Norwalk, CT, research firm's study of home robots. Predicts Gasman, "The 'Doberman' robot—[one] which can attack and injure an intruder—is likely to appear on the consumer market by the end of this decade."

This "attack robot" will feature invincible armor and "lobster-like claws," which can mangle "any intruding living thing, from a mouse to a person." Gasman foresees "a solid market segment of the super-rich and super-paranoid" buying tens of thousands by the early 1990s, as well as "nasty problems" when the killer crustaceans get into the hands of "the Mafia or the Ku Klux Klan."

Most of all, IRD concludes, Gasman anticipates "big, big problems" in dealing with the legal and liability aspects of such machines." Says the forecaster: "I'm afraid a lot of big dogs will be replaced by attack robots, and a lot of small dogs will be killed by them."

Future Computing Inc. has released sets of numbers for 1989, predicting more boom times for micro manufacturers. The home computer market for that year, the Dallas analysts say, will reach \$12 billion, split about equally between hardware and software; the business PC market will top \$55 billion and involve more than 40 percent of U.S. office workers, compared to fewer than eight percent at the end of 1983.

All those computers will use a lot of memory—18.5 trillion bytes, or 578 million 256Kb RAM chips between the home and office markets.

According to *Computer & Software News*, changes may be in the works for a couple of PC advertisers. IBM, the weekly claims, is considering dropping its Charlie Chaplin figure, while NEC is changing its motto from "NEC And Me" to "Number 1 For Me—NEC." Neither slogan rhymes as it's supposed to, because the firm hopes that people spell out the letters N-E-C when, actually, everyone says "neck."

Finally, a personal note: I wrote the review, but that was not my picture on last month's cover and in the Epson Geneva/PX-8 article. I think I look more like Harrison Ford, though some MC editors beg to differ.□

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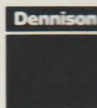
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